

AP[®] Computer Science Principles

ACCESSIBILITY

Teaching Module



AP[®] with WE Service

College Board

College Board is a mission-driven not-for-profit organization that connects students to college success and opportunity. Founded in 1900, College Board was created to expand access to higher education. Today, the membership association is made up of over 6,000 of the world's leading educational institutions and is dedicated to promoting excellence and equity in education. Each year, College Board helps more than seven million students prepare for a successful transition to college through programs and services in college readiness and college success—including the SAT® and the Advanced Placement® Program. The organization also serves the education community through research and advocacy on behalf of students, educators, and schools. For further information, visit collegeboard.org.

AP® Equity and Access Policy Statement

College Board strongly encourages educators to make equitable access a guiding principle for their AP programs by giving all willing and academically prepared students the opportunity to participate in AP. We encourage the elimination of barriers that restrict access to AP® for students from ethnic, racial, and socioeconomic groups that have been traditionally underrepresented. Schools should make every effort to ensure their AP classes reflect the diversity of their student population. College Board also believes that all students should have access to academically challenging coursework before they enroll in AP classes, which can prepare them for AP success. It is only through a commitment to equitable preparation and access that true equity and excellence can be achieved.

WE

WE is a movement that empowers people to change the world through a charitable foundation and a social enterprise. Our service learning program, WE Schools, supports teachers' efforts to help students become compassionate leaders and active citizens, empowering them to take action on the issues that matter most to them. Currently partnered with 18,400 schools and groups, and backed by a movement of 5.3 million youth, we are engaging a new generation of service leaders and providing resources for a growing network of educators.

Our free and comprehensive library of lesson plans is designed to be adapted to meet the needs of any partner school, regardless of students' grades, socioeconomic backgrounds, or learning challenges. Skills development through the program also increases academic engagement and improves college and workplace readiness. Third-party impact studies show that alumni of the program are more likely to vote, volunteer, and be socially engaged. Learn more at [WE.org](https://we.org).

About the Partnership

College Board and WE share a passion for enriching students' learning experiences and developing well-rounded citizens. By combining the academic challenge and rigor of AP® with WE's Learning Framework, AP® with WE Service creates an opportunity for students to consider their classroom work and how it applies to real-world issues, while working closely with their peers to address relevant needs in their local and global communities.

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GENEROUSLY SUPPORTED BY



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Using This Module

AP[®] with WE Service provides a collection of resources to support your planning and implementation of the program. This teaching module, Accessibility, is one of two sample lesson guides for AP[®] Computer Science Principles. As you read through this module, refer to the AP[®] with WE Service Program Guide for additional activities that will support your students' learning throughout the program.

Program Guide

The AP[®] with WE Service Program Guide contains a robust collection of service oriented activities and resources that support the WE Learning Framework. Use these case studies, news articles, and student activities to supplement and strengthen your students' understanding and application of core service learning skills.

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>

WE Resources

WE offers a library of resources to support you in delivering content on social topics and issues, as well as the tools and the inspiration for your students to take social action, empower others, and transform lives—including their own. Access our resources at [WE.org/weschoolsresources](https://we.org/weschoolsresources). An AP[®] with WE Service Program Manager will support you in planning your instruction with access to the resources that are the right fit for you. Digital Social Issues Sessions will connect your students with a motivational speaker or facilitator to deliver an online workshop on global and local issues and topics. Speakers and facilitators can also be booked for school-wide speeches and smaller group or class workshops on site. Full-day Youth Summits provide immersive issues education and action planning opportunities for students. Throughout the module, you will also see tables of optional activities and resources you can pull into your instruction.

Digital Portfolio

Report your students' performance through the AP[®] with WE Service digital portfolio. Step-by-step directions for using the digital portfolio are available on the program website: collegeboard.org/apwe-resources.

How-To Videos

Also available on the program website are how-to videos that explain what AP[®] with WE Service is all about, as well as the steps you need to take to get it going in your class: collegeboard.org/apwe-videos.

Module Sections

THE PLAN SECTION contains information to help you decide how and when you will fit this module into your AP[®] curriculum.

PART 1: INVESTIGATE AND LEARN defines and explores the module topic at local and global levels, and within the context of your AP[®] course curriculum. This will be the majority of your required in-class instruction hours and it is where your students will start to make connections between your AP[®] course content and the module topic.

PART 2: ACTION PLAN guides students as they form teams and begin developing their plan for achieving one local and one global action.

PART 3: TAKE ACTION is where students put their plans into action. As they work, they should keep track of what they do and collect artifacts that capture their efforts. During this part, you may need to guide students as they encounter obstacles or help them maintain their motivation.

PART 4: REPORT AND CELEBRATE describes how students can showcase their projects and share their accomplishments. Presentations and celebrations may be in your class or in the community.

PLAN

TEACH: PART 1

TEACH: PART 2

TEACH: PART 3

TEACH: PART 4

Teaching Module

Accessibility

“The power of the web is in its universality.
Access by everyone, regardless of disability,
is an essential aspect.”

– TIM BERNERS LEE, INVENTOR OF THE WORLDWIDE WEB



Getting to Know the Topic

Accessibility: Globally

Approximately 15 percent of the world’s population lives with some form of disability. Creating an inclusive and accessible society is important to making sure everyone, no matter their ability, has the same opportunities to live a healthy and productive life. Globally, people with disabilities are more likely to face barriers to social integration. Those living in less-developed countries are more heavily impacted because they do not have the same protections and resources as those in many of the world’s wealthiest countries. Technological innovations have the potential to improve the lives of people with disabilities who live in areas that lack accessible social infrastructure.

Computer science is the engine that powers the technology, productivity, and innovation that will positively impact the world around us. It plays a key role in developing affordable and scalable solutions that can be deployed to people with disabilities and countries in need. Advocating for these solutions is also a vital component of creating a more accessible world.

Fast Facts

- ▶ According to the World Bank, one billion people live with some form of disability.
- ▶ The UN Convention on the Rights of Persons with Disabilities was adopted in 2006 to protect the human rights and freedoms of persons with disabilities, with more than 170 countries having signed on. Nonetheless, comparative studies on disability legislation shows that only 45 countries have anti-discrimination and other disability-specific laws, according to the United Nations.
- ▶ According to UNESCO, students with disabilities in developing countries are at higher risk of being excluded from primary and secondary education — up to 50 percent of students with disabilities may be missing school in some nations.

Taking Action Globally

There are a number of ways that students can take action in their school and community to help developing communities around the world to support accessibility. Some ideas include:

- ▶ Identify globally available applications that are inaccessible to people with disabilities and advocate to those companies for more inclusive products.
- ▶ Develop computational solutions to broaden access and remove barriers for people with disabilities.
- ▶ Creating apps or web pages to raise awareness for global organizations that support inclusive and accessible spaces for all.



According to the World Health Organization, 80 percent of people with disabilities around the world live in developing countries.

Getting to Know the Topic

Accessibility: Locally

Nearly one in four Americans lives with some form of disability. In the United States, the Americans with Disabilities Act (ADA) was created in 1990 to protect the rights of individuals with disabilities and support accessible resources, services, accommodations, employment, and more.

Universally designed technology, accessible transportation, and access to educational supports, play an important role in achieving the full participation of people with disabilities in America. Designing with accessibility in mind helps to ensure that people with disabilities are given equal opportunities. Additionally, technology can be used to develop tools specifically for people with disabilities with the aim of enhancing independence and making daily living easier. When more citizens are able to achieve full participation, we all benefit and can achieve a more productive society.

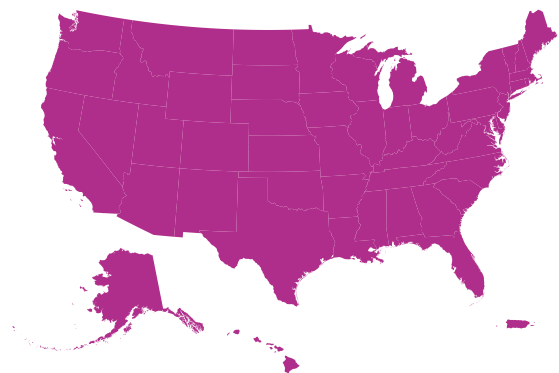
Fast Facts

- ▶ In the United States, almost 61 million people have a disability.
- ▶ According to the Institute on Disability, “If people with disabilities were a formally recognized minority group, at 19% of the population, they would be the largest minority group in the United States.”
- ▶ In 1990, the Americans with Disabilities Act was implemented, prohibiting discrimination against people with disabilities.
- ▶ According to the National Center for Education Statistics, “In 2018–19, the number of students ages 3–21 who received special education services under the Individuals with Disabilities Education Act (IDEA) was 7.1 million, or 14 percent of all public school students.”

Taking Action Locally

Within their local or national community, students can:

- ▶ Develop a campaign to advocate for more accessible solutions in your local community.
- ▶ Create a website or application that showcases inclusive spaces in your neighborhood and educates others on how to make spaces more inclusive.
- ▶ Volunteer with a local organization that serves individuals with disabilities, and possibly work directly with these individuals.
- ▶ Develop an educational game to teach others about disabilities and the importance of access for all people.



Sixty-one million adults in the United States live with a disability, according to the CDC.

Taking Action

Global and Local Service Projects

Why Accessibility?

When communities come together to address accessibility barriers and focus on acceptance of all individuals, communities can grow and become stronger.

- ▶ Focusing on creating accessible environments that everyone can use, no matter their ability, helps build more inclusive communities that foster learning, sharing, and understanding.
- ▶ By promoting tolerance, acceptance, and accessible solutions, people with disabilities feel more welcome to fully participate in society.
- ▶ When spaces and products are developed with accessibility for all in mind, communities are able to allocate resources to additional areas of need instead of expensive modifications for inaccessible design.

Planning Your Instruction

Accessibility

Purpose

In this module, students will develop an understanding of AP[®] Computer Science Principles and discover how computer science can be used as a tool to improve challenges throughout the world. This will be accomplished by introducing students to computer science big ideas of Programming and Algorithms, Data, and Global Impact while exploring the potential computer science holds to improve accessibility both locally and globally. Opportunities for developing and using both data and procedural abstraction have been incorporated for students.

Overview

As presented in the Introduction, this teaching module contains four parts. These are also the four rubric topics you will assess your students on in the digital portfolio:

- ▶ **Part 1: Investigate and Learn:** Practice application development while investigating causes and effects associated with access to health care. These lessons also relate to a variety of service learning concepts, such as the necessity of research to understanding a topic and its effects, and the ways that a topic is connected between local and global levels.
- ▶ **Part 2: Action Plan:** Guide students as they form teams, develop their action plans, and reflect on their ideas.
- ▶ **Part 3: Take Action:** Provide students with suggestions for how to navigate obstacles, overcome conflicts, record actions, and reflect on their work.
- ▶ **Part 4: Report and Celebrate:** Support students as they create portfolios, celebrate their actions, and complete a final reflection on their experiences.

Throughout Parts 1–4, activities that are required for the Recognition Rubric are labeled with an icon (see Icon Legend on page 16). Optional activities that will help students design and complete their service projects, but are not required by the program, are listed in tables throughout each part. These optional activities are available in the AP[®] with WE Service Program Guide or on the WE website, as indicated in the tables.

The parts within the module may be implemented at a variety of different times based on the preferences and needs of schools, teachers, and administrators.

Ensure students are collecting evidence of their work as they go along. The following list includes pieces of work you may want to collect through out the year:

- ▶ Photos
- ▶ Interviews
- ▶ Scripts
- ▶ Screenshots
- ▶ Posters
- ▶ Maps
- ▶ Reflections
- ▶ Thank you notes

Course Alignment

Based on the current AP[®] Computer Science Principles Course and Exam Description, here are the elements of the curriculum framework addressed in this module.

BIG IDEA	ENDURING UNDERSTANDING	LEARNING OBJECTIVE
AAP – Algorithms and Programming	AAP-1 To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways.	AAP-1.D For abstraction: a. Develop data abstraction using lists to store multiple elements. 3.B
	AAP-2 The way statements are sequenced and combined in a program determines the computed result. Programs incorporate iteration and selection constructs to represent repetition and make decisions to handle varied input values.	AAP-2.H For selection: a. Write conditional statements. 2.B
	AAP-3 Programmers break down problems into smaller and more manageable pieces. By creating procedures and leveraging parameters, programmers generalize processes that can be reused. Procedures allow programmers to draw upon existing code that has already been tested, allowing them to write programs more quickly and with more confidence.	AAP-3.A For procedure calls: a. Write statements to call procedures. 3.B
IOC – Impact of Computing	IOC-1 While computing innovations are typically designed to achieve a specific purpose, they may have unintended consequences.	IOC-1.A Explain how an effect of a computing innovation can be both beneficial and harmful. IOC-1.B Explain how a computing innovation can have an impact beyond its intended purpose. 5.C

Connections to AP[®] Computer Science Principles Focus Areas

Some content from the AP[®] Computer Science Principles Course and Exam Description is identified as more challenging for students based on AP[®] Chief Reader commentary from previous AP[®] Computer Science Principles Exams. This content is referred to as a focus area. The activities in this module provide opportunities for students to engage with this content and practice the associated skills needed to grasp these concepts.

Abstraction is a challenging concept for students and has been identified the focus area for this module. When developing abstractions students need to:

- ▶ Fully utilize the power of abstraction to make their program code more readable and reusable.
- ▶ Develop data abstractions that leverage the use of lists to allow for variability in the size of the data set being used in the program.
- ▶ Use the context of their program code when explaining how their developed abstraction manages the complexity of their program and is necessary, rather than writing in general about how abstraction manages complexity.

WE Service Concepts

Based on the WE Learning Framework, here are the particular WE Service concepts addressed in this module.

STUDENTS WILL UNDERSTAND THAT...	STUDENTS WILL BE SKILLED AT...	STUDENTS WILL KNOW THAT...
<ul style="list-style-type: none"> • Social issues are complex and, therefore, research is essential to understanding them • Often times, local and global issues can be interconnected • Understanding the role of cultural, social, and economic factors is vital to the development of solutions • People have a civic identity, which provides opportunities for public action • Serving the greater community can be meaningful for the individual and the community • Creating social change happens through a set of skills, including creating action plans • Carrying out an action plan requires personal and group resilience • Individual behavior and decisions toward a social issue impact the larger global context of that issue 	<ul style="list-style-type: none"> • Working collaboratively in teams • Working collaboratively with community partners (where applicable) • Researching an identified social issue on local and global levels • Creating an action plan • Successfully implementing an action plan • Educating others (classmates, community partners, school, etc.) about a social issue • Presenting actions and results to wider audiences • Applying critical thinking • Thinking entrepreneurially • Demonstrating leadership • Reflecting on learning about the social issue • Reflecting on working to create social change 	<ul style="list-style-type: none"> • AP® course content is relevant to addressing social issues and topics, and provides knowledge toward creating working solutions • There are organizations working for social change on the social issue • They have an important role to play as students, employees, volunteers, and as citizens to have a positive impact on their local and global community

See full WE Learning Framework and details at [WE.org/we-schools/program/learning-framework](https://we.org/we-schools/program/learning-framework).

Icon Legend

As described in the AP[®] with WE Service Program Guide, the WE Learning Framework identifies the most relevant core skills students will develop as they progress through this module.



ARGUMENT FORMATION



INFORMATION LITERACY



LEADERSHIP SKILLS



ORGANIZATION



ACTION PLANNING



RESEARCH AND WRITING



CRITICAL THINKING



REFLECTION

Throughout each part of this module, look for these additional icons to identify the following opportunities and notes:



Teacher Tip:

Suggestions for ways to implement or modify the activities with students.



Focus Area Alert:

Opportunities for students to practice content and skills that are pivotal for improving student performance in the AP[®] course and on the AP[®] Exam (see page 14 for a description of the AP[®] Computer Science Principles Focus Areas addressed in this module).



Check for Understanding:

Recommendations for ways to formatively assess student progress and mastery of the content and skills practiced in the activities.



Look out for how the lesson aligns to one of the International Society for Technology in Educations (ISTE) standards for innovation in education. Today's students must be prepared to thrive in a constantly evolving technological landscape. The ISTE Standards for Students are designed to empower student voice and ensure that learning is a student-driven process.

For deeper learning and activation visit <https://www.we.org/en-US/our-work/we-schools/ap/> to access the ISTE Standards Guide.

Pay particular attention to activities labeled with the red checkmark icon:



Recognition Checkmark:

Identifies activities that are required in the Recognition Rubric. We encourage you to use the most effective instructional approaches to meet your students' needs. You may use alternative activities if they achieve the same outcomes as the required activities and align with the Recognition Rubric. Review the rubric here: <https://apcentral.collegeboard.org/pdf/apwe-recognition-rubric.pdf>



Part 1: Investigate and Learn

Investigate and Learn is divided into the following lessons:

- ▶ Lesson 1: Overview of Issue
- ▶ Lesson 2: Causes and Effects
- ▶ Lesson 3: Future Concerns and Solutions

Every student in every AP[®] with Service course will do the following as part of their learning and investigation:

- ▶ Learn about the issue locally and globally within the context of the course
- ▶ Explore causes and effects locally and globally
- ▶ Analyze impacts for the future on their local community and the world

WE Service Framework



Overview for Part 1: Investigate and Learn

In this module, students will begin to develop the following Enduring Understandings...

IOC-1 While computing innovations are typically designed to achieve a specific purpose, they may have unintended consequences.

AAP-1 To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways.

AAP-2 The way statements are sequenced and combined in a program determines the computed result. Programs incorporate iteration and selection constructs to represent repetition and make decisions to handle varied input values.

AAP-3 Programmers break down problems into smaller and more manageable pieces. By creating procedures and leveraging parameters, programmers generalize processes that can be reused. Procedures allow programmers to draw upon existing code that has already been tested, allowing them to write programs more quickly and with more confidence.

ACTIVITY	PG #
LESSON 1: OVERVIEW OF THE ISSUE	
Activity: Understanding Disabilities	21
Activity: Web Accessibility	24
LESSON 2: CAUSES AND EFFECTS	
Activity: Mapping Connections	28
Activity: Problem Tree	30
Activity: Exploring Disability and Public Policy	32
LESSON 3: FUTURE CONCERNS AND SOLUTIONS	
Activity: Innovative Solutions	35
Activity: Translation App	38
Activity: Needs Assessment and Solution Tree	39
Activity: How to Be An Ally for People with Disabilities	42
REFLECT: INVESTIGATE AND LEARN	
Activity: Making Connections with Students' Lives	46
Activity: Summarizing the Investigation	47

Lesson 1: Overview of the Issue

In this lesson, students will learn the definition of disability through stories of people with disabilities. They will have the opportunity to learn about assistive technologies that are available to help people with disabilities be able to fully access the web.

Learning Goals:

- ▶ People with disabilities face barriers to full inclusion.
- ▶ Universal Design, Assistive Technology, and Accessibility tools can help people with disabilities be more fully included and independent within society.
- ▶ Developers must follow guidelines when building websites and other applications to ensure that they are fully accessible to people with disabilities.

Definitions:

Disability: A disability is defined as a condition or function judged to be significantly impaired relative to the usual standard of an individual or group. The term is used to refer to individual functioning, including physical impairment, sensory impairment, cognitive impairment, intellectual impairment, mental illness, and various types of chronic disease. — The United Nations

Universal Design: The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. — Ron Mace, Founder of The Center for Universal Design

Accessibility: Accessibility is when the needs of people with disabilities are specifically considered, and products, services, and facilities are built or modified so that they can be used by people of all abilities. — Centers for Disease Control and Prevention

Assistive Technology: Assistive technologies (ATs) are devices or equipment that can be used to help a person with a disability fully engage in life activities. — Centers for Disease Control and Prevention

Additional Resources:

- ▶ Curricula on Web Accessibility from W3C <https://www.w3.org/WAI/curricula/>
- ▶ Disabled World—Categories of disability <https://www.disabled-world.com/disability/types/#mobility>
- ▶ WHO Fact Sheet: Disability and health <https://www.who.int/news-room/fact-sheets/detail/disability-and-health>
- ▶ CDC Report: Disability and Health Disability Barriers <https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html>

Activity: Understanding Disabilities

Using resources from the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), students will learn about what disability is and how it impacts people’s experiences.

Suggested Timing: 45 minutes

Guiding Questions:

How do we define disability? What barriers to inclusion do people with disabilities experience? What tools are available to support people with disabilities? What types of technologies are available that directly support people with disabilities? Do these technologies create any additional barriers?

Real World Application:

Through the videos and resources below, students will learn about different types of disabilities, how to communicate with and about people with disabilities, and begin to explore different inclusion strategies.

- ▶ Give students time to reflect on what disability means to them
- ▶ Now, watch the videos “What’s Disability To Me” — students will use these videos to complete the Understanding Disabilities Worksheet
 - What’s disability to me? Feliza’s story: <https://youtu.be/wu-f1FEFNMY> (This video is in Spanish — you may need to turn on subtitles.)
 - What’s disability to me? Rachael’s story: <https://youtu.be/nwBzb7m2n64>
 - What’s disability to me? Faustina’s story: <https://youtu.be/w5QXcFk4kvA>
 - What’s disability to me? Mia’s story: https://youtu.be/E_2ZEwhh9WQ
- ▶ In a journal or notebook, ask students to write a reflection to the following questions: How does your original reflection on what disability is to you differ from those that you saw in the video? Did anything surprise you?

Worksheet:

Break students into groups of 2–3 to complete the Understanding Disabilities Worksheet. Direct them to the [Categories of Disabilities](#) web page. Students should make the connection between the category of disability and the individual they chose in the “What’s Disability to Me” videos.

Following this, have students look at the [Disability Barriers to Inclusion](#) web page and identify what barriers their selected person could potentially face.

Finally, to understand how technology and design can be used to support people with disabilities, share the [Disability and Health Inclusion Strategies](#). Have students define Universal Design, Accessibility, and Assistive Technology and start to identify ways these terms are used to promote inclusivity.



Have students complete the Understanding Disabilities Worksheet, found in the Student Workbook.

Additional Resources:

Communicating with and About People with Disabilities: <https://www.cdc.gov/ncbddd/disabilityandhealth/materials/factsheets/fs-communicating-with-people.html>

Deafness and Hearing Loss: https://www.who.int/health-topics/hearing-loss#tab=tab_3

Blindness and Vision Impairment: https://www.who.int/health-topics/blindness-and-vision-loss#tab=tab_1

Spinal Cord Injury: <https://www.who.int/news-room/fact-sheets/detail/spinal-cord-injury>

Child and Adolescent Mental Health: https://www.who.int/mental_health/maternal-child/child_adolescent/en/



Teacher Tip:

If students respond inappropriately when watching the videos of people with disabilities, that is a great opportunity to point out the attitudinal barrier that people with disabilities face.



Check for Understanding:

In groups of 4–5, have students use a shared document to collaboratively draft their definition of disability. Have each group share their definitions with the class.



ISTE Standard - Knowledge Constructor:

Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.



NAME: _____

TEAM MEMBERS: _____

Understanding Disabilities

Consider one of the people highlighted in the “What’s Disability to Me” videos.

- ▶ Feliza’s story: <https://youtu.be/wu-f1FEFNMY> (This video is in Spanish — you may need to turn on subtitles.)
- ▶ Rachael’s story: <https://youtu.be/nwBzb7m2n64>
- ▶ Faustina’s story: <https://youtu.be/w5QXcFk4kvA>
- ▶ Mia’s story: https://youtu.be/E_2ZEwhh9WQ

Whose story did you choose: _____

Which category(ies) of disability seem to impact this person and how? _____

Disability Barriers to Inclusion: Read the Common Barriers to Participation Experienced by People with Disabilities on this web page: <https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html>

With your group, discuss how each barrier to inclusion might impact the person in the video that you chose.

Write down your group’s conclusions here: _____

Disability Inclusion Strategies: Using the Disability and Health Inclusion Strategies web page, <https://www.cdc.gov/ncbddd/disabilityandhealth/disability-strategies.html>, answer the following questions:

How could Accessibility, Universal Design, and Assistive Technologies benefit the person in your video? Make sure to assess each inclusion strategy individually and also note connections showing how they build upon each other.

STRATEGY	BENEFITS
Accessibility	
Universal Design	
Assistive Technologies	

List some important tips about how to communicate with and about people with disabilities. How could you use these tips for communicating with the person in the video you chose? Make sure to include any tips that are new to you!

Activity: Web Accessibility

In this activity, students will learn about several tools that help make the web more accessible for people with disabilities and how to design with accessibility in mind.

Course Alignment:

IOC-1.A Explain how an effect of a computing innovation can be both beneficial and harmful.

Suggested Timing: 45 minutes

Materials: Screen reader or other accessibility tools on laptop, chromebook, or other device; index cards

Guiding Questions:

What tools are available to support people with disabilities in fully accessing the web? Do you notice gaps or improvements that could be made to these tools? Are these tools available globally and in developing regions?

Real World Application:

People come in and out of needing accommodations throughout their lives, e.g., after breaking an arm, speech to text might be a helpful tool. It is important to expose students to a variety of tools that have been created specifically to help people with disabilities but have had a broader impact on society. Universal Design can be applied to any design process.

- ▶ Watch this video on the Web Accessibility Initiative as a class: <https://www.w3.org/WAI/videos/standards-and-benefits/>
- ▶ Review with students the four Core Principles of the Web Content Accessibility Guidelines shown in the video. The four Core Principles are as follows:
 - Perceivable: for example, so people can see the content, or hear it.
 - Operable: for example, so people can use the computer by typing, or by voice.
 - Understandable: for example, so people get clear and simple language.
 - Robust: so people can use different assistive technologies.
- ▶ Provide each student with an index card or two. For virtual instruction, you can use an online tool like [Padlet.com](https://www.padlet.com) instead. As students watch the following video (<https://www.youtube.com/watch?v=3f31oufqFSM>), have them write down a time that they or someone they know used one or more of the demonstrated tools and what beneficial effects it may have had on them or that person. They should use a new index card for each tool they are familiar with.
- ▶ Pause the video after each section to give students a moment to reflect and complete their index card. Note: Each individual video may also be found on this page: <https://www.w3.org/WAI/perspective-videos/>
- ▶ Give students a few moments to reflect on their own usage of accessibility tools and then invite them to share with the class. If you used Padlet, have students take time reading through the reflections of the other students.

Using a Screen Reader:

Now that students have had a chance to learn about and reflect on what makes web content accessible, have them explore further using a screen reader.

Instruct students to download one of the following free screen readers for their computer:

- ▶ Non Visual Desktop Access: <https://www.nvaccess.org/>
- ▶ Apple Voice Over: <https://www.apple.com/accessibility/mac/vision/>
- ▶ Chrome Vox: <http://www.chromevox.com/>

Now, have students test their screen reader on a document or website to make sure it is enabled and to practice using their keyboard.

Guide students to the Accessible University Demo Site - Accessible Version (<http://www.washington.edu/accesscomputing/AU/after.html>) Have students try to navigate using only their keyboard. If students have the ability to see, have them consider navigating the site with their eyes closed.

Now that students have spent time navigating the accessible site, direct them to this inaccessible version of the same site: Accessible University Demo Site - Inaccessible Version (<http://www.washington.edu/accesscomputing/AU/before.html>). Again, if students have the ability to see, consider having them navigate the site with their eyes closed.

After students have navigated both sites, have them reflect on their experience by answering the following prompts:

- ▶ Describe your experience using the screen reader.
- ▶ Have you used one previously?
- ▶ Were you able to navigate without using the mouse or looking at the screen?
- ▶ Was it easier to navigate the accessible site?
- ▶ How did the accessible site compare to the inaccessible site?



Teacher Tips:

- ▶ If students do not have the ability to download tools on their devices, perhaps use the teacher computer to demonstrate the navigation on the screen reader, and have students come up and try to navigate the screen.
- ▶ You can find additional resources to help students understand accessible design on the resources page in the back of this module.



Check for Understanding:

Ask students to consider all that they learned about accommodations for people with disabilities. Invite them to write a Twitter-length summary that captures the most important aspects of web accessibility that they learned today. Invite students to share their Twitter summary with a partner or via a padlet. Next, invite students to share a Twitter summary that they heard that did a particularly good job of getting to the core of this issue.



ISTE Standard - Empowered Learner

Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use, and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies.



Have students complete the Using a Screen Reader Worksheet, found in the Student Workbook.



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Using a Screen Reader

1. Download or turn on a screen reader for your computer:
 - ▶ NVDA: Non Visual Desktop Access (free)
 - ▶ Apple VoiceOver: Mac OSX Screen Reader (free) To turn on Apple VoiceOver, go to System Preferences -> Accessibility » VoiceOver » Enable Voiceover
 - ▶ Chrome Vox: Chrome (OS) Screen Reader (free)
2. Test your screen reader to make sure it is enabled and practice navigating using only your keyboard.
3. Go to this website, which was designed to be fully accessible: [Accessible University Demo Site - Accessible Version](#). Navigate it using only your keyboard. If you have the ability to see, consider navigating the site with your eyes closed.
4. Now that you have spent some time using the screen reader on that site, go to this inaccessible version of the same website: [Accessible University Demo Site - Inaccessible Version](#). Attempt to navigate it using only your keyboard. If you have the ability to see, consider navigating the site with your eyes closed.
5. Describe your experience using the screen reader. Have you used one previously? Were you able to navigate without using the mouse or looking at the screen? Was it easier to navigate the accessible site? How did the accessible site compare to the inaccessible site? What challenges did you face and did you notice any unforeseen consequences?

Lesson 2: Causes and Effects

In this section, students will continue to learn more about the barriers people with disabilities face each day. They will also explore how public policy is influential in providing protections and necessary resources to those with disabilities.

Learning Goals:

- ▶ Understand the protections and resources available to people with disabilities in your local community.
- ▶ Practice collaboration and explore how concept mapping can be used to create a robust visual representation of the issue of accessibility.
- ▶ Deepen understanding of the barriers to full inclusion faced by people with disabilities, as well as the impact of fully including people with disabilities.

Activity: Mapping Connections

Students will construct a concept map to identify everyday tasks and interactions that may pose a challenge to people with disabilities.

Course Alignment:

- ▶ CRD-1.B Explain how computer innovations are developed by groups of people.
- ▶ CRD-1.C Demonstrate effective interpersonal skills during collaboration.

Suggested Timing: 45 minutes

Materials: Pen and paper, bubbl.us

Guiding Questions:

What daily activities may not be accessible to those with disabilities? What places are most inaccessible? How does this affect people with disabilities? Can computer science be used to address these challenges?

Real World Application:

Watch this video (<https://www.youtube.com/watch?v=EAxnE2XzL0k>) from the World Economic Forum that highlights the importance of inclusivity and how designers are focused on making a more accessible world.

Concept Mapping:

A concept map is a visual organization and representation of knowledge. It shows concepts and ideas and the relationships between them.

Students can create their maps using pen and paper, Microsoft PowerPoint, or any free online tools or apps available, like bubbl.us. You can determine which tool is of best fit for your class or allow your students to select which one they would like to use.

- ▶ Before beginning this activity, it may help to introduce students to the idea of a concept map using this video (<https://www.youtube.com/watch?v=sZJj6DwCqSU>).
- ▶ Divide students into groups of 3–4 to develop a concept map that helps them identify how their daily activities may be more challenging for people with disabilities. This activity can be done individually but working in groups will help students generate more ideas and connections.
- ▶ Begin by having students think about the different types of disabilities they learned about in Lesson 1. How are people with those disabilities affected in everyday life?
- ▶ Have students start at the middle of their map with the concept of accessibility. From there, have student branch off into the different places they visit each day.
 - Immediate Surroundings
 - School
 - Home
 - Community
- ▶ Direct students to think about the smallest interactions they have with their environments. Ex: cellphones, parking, opening doors or lockers, stairs, hearing announcements, driving, etc.
- ▶ Once students have a robust map of daily interactions, have them tag the disabilities they learned about in Lesson 1 to the activities that may present a challenge for those disabilities.

- ▶ As students build out their map, some daily activities will be easily connected to issues of accessibility, others will be more obscure. Ask students to think critically and move beyond the most obvious connections. For example, stairs are an obvious challenge for multiple disabilities. But maybe a person has limited mobility and is visually impaired—if posted signs and visual cues are the only directions to the nearest elevator, how can a visually impaired person navigate this situation?
- ▶ Now, have students look at their maps and draw connections between activities and the environments they take place in. Are there recurring themes?

Once students have completed their maps, have groups pair up and compare the ideas they developed and share their findings with the class. Encourage groups to modify their maps to include the ideas of the other group. These might be ideas that are included in the other group's map, or new ideas that evolve from the shared conversation. Students should use these maps to reference back to as they move into solutioning in Lesson 3.



Teacher Tips:

- ▶ Creating a concept mapping is an iterative process. Having students use an online or app-based platform will allow them to add ideas and make more connections throughout the year.
- ▶ After group work, you could create a class concept map that identifies the key themes and areas of focus your class is particularly interested in.

Activity: Problem Tree



Have students look at the Problem Tree graphic organizer, which helps guide students in thinking about and articulating the issue as a problem, and then going further by breaking down the causes and effects of the problem. This is necessary before exploring steps needed to address the problem, as it allows students to consider the depth and even the breadth of an issue. Display a larger version of this graphic organizer, perhaps projected onto a screen, and explain the three sections.

Before beginning, it may help to model this activity using a simplified non-issue related example first.

For example: If the problem is that I am late to school, what are some potential causes of that problem? Perhaps I didn't hear my alarm or got distracted as I was getting ready. Next what would be the impact of my tardiness? I would miss instruction and feel behind or frustrated.

Now, shift the discussion to the issue at hand—accessibility—and help the students brainstorm what they already know from previous lessons. Encourage them to reflect back on the videos from Lesson 1, such as Faustina's story.

<https://www.youtube.com/watch?v=w5QXcFk4kvA>. What were the causes and effects of failing to give a person a wheelchair or add ramps? Remind students to also think back to causes and effects they observed in their community maps.

- ▶ **Problem:** The issue that is being studied. In this case, accessibility.
- ▶ **Causes:** Issues, situations, or phenomena that have led to the problem. In this case, you might prompt exploration of causes by asking, “What are some of the factors hindering accessibility?” Encourage students to think about the “causes of causes.” For example, if a student suggests that people with disabilities experience poverty because they cannot work, ask the student to consider what causes people with disabilities to be unable to work. Then, repeat this exercise and think further about the causes of the next levels of causes.
- ▶ **Effects:** Results created by the problem. As with causes, encourage students to explore multi-layered effects, or “effects of effects.” For example, if a student suggests that an effect is that people with disabilities may not be able to access certain buildings, ask them the result of that effect, one of which might be that people cannot work in certain buildings. Next, the students should ask what the effects are of people not being able to work in certain buildings. The more students drill, the more they will deepen their critical thinking and analysis.

Have students build their own Problem Trees by using the graphic organizer and adding causes, going from the base of the tree to the tips of the roots and moving from larger concepts to more specific sub-topics. Make sure the students understand that their Problem Tree should have a dual focus on both the local and global scope of the issue to accessibility. Students should then do the same with impacts, going from the base of branches to the tips of the leaves and moving from large impacts to more specific topics.



Have students use the Problem Tree Worksheet, found in the Student Workbook.



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Problem Tree

Students will learn more about the issue they are tackling as they apply what they have learned, along with their critical thinking skills, to consider the causes and effects of the problem presented through the issue.

Leaves/branches: Effects

These are the results created by the problem. At first, this part of the issue appears easy to tackle, but when leaves and branches are trimmed, they grow back quickly. Consider the multi-layered effects, or “effects of effects,” that can arise when a problem goes unaddressed. Always ask: “Then what happens?”

Ex. People with disabilities are more likely to face attitudinal, physical, policy, social, and transportation barriers in day to day life.

Trunk: Problem

This is the key issue that is being studied. Because it is not as apparent as the leaves, the core problem itself sometimes takes a little longer to identify.

Ex. Because of attitudinal, physical, policy, social, and transportation barriers to inclusion, people with disabilities more often experience unemployment, poverty, lack of health care, and lack of education.

Roots: Causes

These are the situations or factors that have led to the problem. When exploring the root causes of a problem, ask yourself “Why does this problem exist?” Dig deeper to consider the “causes of causes”—the multiple layers of factors that contribute to a problem.

Ex. People with disabilities experience barriers because society is not designed using inclusive principles that ensure all people have equal access, regardless of ability.

Problem Tree Worksheet: Copyright © 2018 WE. All rights reserved.

Activity: Exploring Disability and Public Policy

Students will look at protections for people with disabilities at a local and global level.

Course Alignment:

CRD-1.C Demonstrate effective interpersonal skills during collaboration.

Suggested Timing: 45 minutes

Guiding Questions:

What protections are necessary to ensure people with disabilities have access to the resources they need? How can I advocate for resources for people with disabilities? Are certain people left out of protections? Is this information easy to access?

Real World Application:

Watch this video (<https://www.youtube.com/watch?v=o3mqgrmKz7s>) on the passing of the Americans with Disabilities Act (ADA). Have students think about the importance of legal protections and how it provides safe work places, equal access, and necessary resources for people with disabilities.

Did You Know?:

Did You Know is an activity that allows students to share information with their peers and generate questions for further exploration.

Divide students into 4 groups: School District, City, State, Country. Have students search online for information regarding the protections or resources for people with disabilities in the area of their assigned groups and identify three facts or statements about the protections or resources they discover. Students can find information by searching “disability protections and resources in _____” Once students have decided on their facts or statements, have them share with the class. This can also be done virtually through a shared document that students can collaborate on.

Once students have decided on their statements, have each group present their findings. As students share out the information they’ve found, those in other groups should develop and ask questions back to the group presenting about the information they have shared. If working virtually, have students add their questions and comments to the shared document.

Now, have students take a few of the questions posed and return to their search to find the answers and share back with the class. Throughout this activity, have students keep in mind how easy or hard it was to find, understand, and share the information they found. How does this affect people with disabilities?



Teacher Tips:

- ▶ Some students may not be able to find answers to the questions posed and that’s ok. Prompt students to think about why they weren’t able to find the answers. Do protections or resources not exist? Is the information too hard to find? What are the effects of the information not being readily accessible?
- ▶ Add another layer of investigation by having students develop a second round of questions based on the answers provided from the first round.
- ▶ This activity can easily be adapted to look at the issue globally by assigning or allowing students to investigate protections and resources in different countries.



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Did You Know?

<p>Did you know our school district:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Questions:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Answers:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>
<p>Did you know our city:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Questions:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Answers:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>
<p>Did you know our state:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Questions:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Answers:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>
<p>Did you know our country:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Questions:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>	<p>Answers:</p> <p>1. _____ _____</p> <p>2. _____ _____</p> <p>3. _____ _____</p>

Lesson 3: Future Concerns and Solutions

In this section, students will have an opportunity to explore solutions and create apps while learning how to incorporate lists and procedures into their programs.

Learning Goals:

- ▶ Gain practice using lists and procedures to manage complexity in a program.
- ▶ Deepen understanding of the solutions that have been developed to increase accessibility and inclusion of people with disabilities.
- ▶ Better understand the impact that technology can have on our society, economy, and culture, and how technology specifically impacts people with disabilities.

Activity: Innovative Solutions

In this lesson, students work in small groups to explore a solution that has been developed for people with disabilities. They share their learnings about its potential impact on our society, economy, or culture, while keeping Universal Design in mind.

Course Alignment:

IOC-1.A Explain how an effect of a computing innovation can be both beneficial and harmful.

IOC-1.B Explain how a computing innovation can have an impact beyond its intended purpose.

Suggested Timing: 70 minutes

Materials: Sticky notes or padlet.com

Guiding Questions:

What solutions have already been created for people with disabilities? Do all solutions have a positive impact? Do any have unintended consequences? How do solutions impact our society, economy, and culture?

Real World Application:

Students will be exploring actual solutions, as well as proposed solutions for supporting people with disabilities. Students will benefit from learning about how others are working to support this community.

Worksheet:

Direct students to explore the resources at the top of the worksheet to identify a solution that interests them. You can also encourage students to search for additional solution outside of the ones provided.

Once students have chosen a solution, have them dig deeper into the offerings of that solution and answer the questions in the worksheet. While these questions explore the beneficial and harmful effects of the solutions, make sure students catalog any ideas, enhancements, or additional questions they think of throughout the activity.

After completing the worksheet, have students pair up and discuss the solutions they explored. If there are groups that explored the same solution, this could be a good time to have them compare their answers to identify alternative viewpoints.

Optional: Have students make a social media post, advertisement, video, slideshow, or other computational artifact to share with the class about the solution they explored. Remember to apply Universal Design to your work, thinking about the Accessibility Tools in Lesson 1, such as Clear Layout and Design, Colors with Good Contrast, captions, and Understandable Content.



Have students complete the Innovative Solutions Worksheet, found in the Student Workbook.



Teacher Tip:

Make sure to include the language from the first two activities regarding barriers and inclusion tools when students are presenting their work.



Check for Understanding:

Compass Points Formative Assessment: Draw the points of the compass on a padlet or on a large piece of paper or whiteboard. Ask students to answer the following questions on sticky notes and place their answers in the appropriate section of the compass:

- ▶ 1. E = Excited. What excites you about these innovations?
- ▶ 2. W = Worrisome. What do you find worrisome about any of these innovations?
- ▶ 3. N = Need to Know. What else do you need to know about these innovations in order to evaluate them better?
- ▶ 4. S = Stance or Suggestion for Moving Forward. What is your current stance or opinion on one of these innovations?
- ▶ You can read more about the Compass Points Thinking Routine here: https://pz.harvard.edu/sites/default/files/Compass%20Points_0.pdf



ISTE Standard - Knowledge Constructor

Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.



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Innovative Solutions

In a group of 2–3 people, explore the links below, which contain one or more innovative solutions that have been designed and developed to support the needs of people with disabilities. After looking through the titles and a few of the ideas on the websites, choose a solution that interests you or find one on your own.

- ▶ **Eyespeak:** Standalone communication glasses
- ▶ **AccessNow:** Crowdsourcing accessible places
- ▶ **“A group of Google employees spent their '20% time' making Google Maps wheelchair-friendly”**
- ▶ **Global Accessibility News:** Stories about current research on accessibility
- ▶ **Information and Communication Technologies (ICTs) from the European Disability Forum**
- ▶ **13 Disability Resources on the Web You May Not Know About**
- ▶ **Walleye Tank Past Competitions** (The Walleye Tank is Minnesota’s Life Science Pitch Competition providing an educational and promotional opportunity for emerging and established medical and life science companies. Often the projects work to solve issues for people with disabilities.)

Answer the following questions about the project that you choose.

1. What is the solution and what category of disability impact does it target?

2. How might this solution have a beneficial effect on the people for whom it was designed?

3. Explain a beneficial and a harmful effect to society, economy, or culture that could happen as a result of this solution.

4. Do you think that this solution will work? Are there any unintended consequences that you might be able to predict?

Make sure to include the language from the first two activities regarding barriers and inclusion tools when you are presenting your work.

Activity: Translation App

Students will learn how to manage complexity in their programs by including procedures that can be reused. While this activity focuses on the use of App Inventor, the concepts learned can be applied to other programming languages.

Course Alignment:

AAP-2.B Represent a step-by-step algorithmic process using sequential code statements.

AAP-3.A For procedure calls:

a. Write statements to call procedures. **3.B**

Suggested Timing: 45 minutes

Materials:

- ▶ App Inventor login.
- ▶ Android tablet, if available. If no tablet is available, App Inventor emulator installed on student machines.

Students should be oriented to the interface of App Inventor before beginning this activity. Because this is a beginner tutorial, no other prerequisite knowledge is required.

Guiding Questions:

How do I create an app that helps people with a need? How does an algorithm work?

Pair Programming:

Students will be working together to create a translation app. Two programmers work together as a pair. One (the driver) writes program code, while the other (the observer, pointer, or navigator) reviews each line of program code as it is typed in.

App Inventor can be used to create basic Android apps. Students who make this app can use it to translate.

Put students in groups of 2. If you have an odd number of students, create one group of 3. Students will use Pair Programming to complete the Youth Power Mobile App Building Guide for the Translator App here:

<https://appinventor.mit.edu/explore/app-building-guides>

If students have not yet used App Inventor, they will need to create an App Inventor account before they get started.



Teacher Tip:

If this is the first time you have used Pair Programming with your students, it will be important to review the ground rules. Share this short video with your students to introduce Pair Programming:

<https://www.youtube.com/watch?v=vgkahOzFH2Q>



Check for Understanding:

Circulate the room and observe each group's demonstration of their app. Be sure to provide students with verbal and relevant in person feedback.



ISTE Standard - Innovative Designer:

Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.

Activity: Needs Assessment and Solution Tree

Have students carry out research to begin developing an understanding of specific issues and topics related to their broader issue. For example, accessibility is a big umbrella for many sub-issues (that are equally large, but more focused) that ladder up to the issue of accessibility.

This is best done by having student groups carry out research on organizations that are working to combat this issue. Students should use the Needs Assessment Worksheet to carry out an analysis.

Have students use the solutions graphic organizer to keep track of current solutions that are in use to combat the issue of accessibility. Model how to go from the center of the proposed solution graphic organizer to the more specific details of the key elements to the solution and the possible outcomes of the solution.

Encourage students to revisit and work in parallel with their Problem Tree cause-and-effect graphic organizer, which can help to ensure that their solutions are addressing actual problems. Students should develop four solutions, and their accompanying key elements and possible outcomes. They should keep track of any sources they used to fill out the graphic organizer.

Walk students through the Solution Tree, starting in the middle.

Goal: This is the problem from their Problem Tree, but re-framed as a goal.

Then go to the roots, which is the investigation of the solutions.

Solutions: These are the actions needed to solve the problem and achieve the goal stated at the center of the solution tree. When exploring solutions, students should ask, “How will this solve the problem?” Have them dig deeper to think holistically, so that they are looking beyond the short-term and addressing not only the symptoms of the problem but the root causes as well.

And finally to the leaves, which explore the outcomes.

Outcomes: These are the results created by the solution. Results may appear as straightforward as having achieved goals, but when students consider the ripple effect and outcomes of sustainable results, the impact is far-reaching and long-lasting. Always ask, “Then what happens?”



Have students use the Solution Tree and Needs Assessment Worksheets, found in the Student Workbook.



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Needs Assessment

The following series of questions helps you to analyze and identify ongoing areas of need within organizations addressing your issue.

1. Identify 3-5 organizations, with at least two of them using technology, working on issues related to the issue your team is working on.

2. What does each organization do well in response to the issue and/or related issues?

3. What could each organization do better in its response?

4. What areas of need related to access to your issue have you learned about that each organization is NOT addressing?

5. Considering all 3-5 organizations, where are there ongoing needs that are not being adequately addressed?

6. Considering all 3-5 organizations, where are there ongoing needs that are being addressed successfully, and to which you can add further efforts to support the issue?



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Solution Tree

(1 of 1)

In your Solution Tree graphic organizer, start by rewriting the problem from your Problem Tree, and reframing it as a goal at the trunk of the tree. Then consider the different solutions (the roots) and possible outcomes of the solutions (the branches).

Leaves/branches: Outcomes

These are the results created by the solution. Results may appear as straightforward as having achieved goals, but when you consider the ripple effects and outcomes of sustainable results, the impact is far-reaching and long-lasting. Always ask: “Then what happens?” Ex. People who are deaf or hard of hearing will be able to fully participate in a video conferencing call on any platform, without need for an expensive translator, even if they cannot see the video stream well enough to speech read. This will enable people who are deaf or hard of hearing to more fully participate in their community and to work virtually.

Trunk: Problem

There is not yet technology that allows people who are deaf or hard of hearing to participate in video conferencing on any platform.

Trunk: Goal

Part of the accessibility module on every device will include a more robust software package that allows the captions to work effectively, even when there is background noise.

Roots: Solutions

These are the actions needed to solve the problem and achieve the goal stated at the center of the Solution Tree. When exploring solutions, ask yourself “How will this solve the problem?” Dig deeper to think holistically, so that you are looking beyond the short-term and addressing not only the symptoms of the problem but the root causes as well. Part of the accessibility module on every device will include a more robust software package that allows the captions to work effectively, even when there is background noise.

Activity: How to Be an Ally for People with Disabilities

In this activity, students will develop an app to teach others how to make the world more inclusive and accessible for people with disabilities. This app will include the use of data abstraction by creating lists to manage program complexity.

Course Alignment:

AAP-1.D For data abstraction:

a. Develop data abstraction using lists to store multiple elements.

AAP-2.H For selection:

a. Write conditional statements.

Suggested Timing: 90 minutes

Materials:

- ▶ App Inventor
- ▶ App Inventor QuizMe Tutorial: <https://appinventor.mit.edu/explore/ai2/quizme>

Guiding Questions:

What tools have you learned about that support full inclusion for people with disabilities? What actions can everyone take in order to more fully include people with disabilities? How can you use programming to teach others how to make the world more inclusive and accessible for people with disabilities?

QuizMe App:

Students will have the opportunity to teach others what they have learned about accessibility and inclusion. Removing barriers to inclusion for people with disabilities has a tremendous impact. Students will also have the experience of building a simple application from scratch.

Provide students with the How to Be an Ally for People with Disabilities worksheet in the Student Workbook.

In pairs and using the same App Inventor login they used to complete the Translator App, have students complete the QuizMe tutorial for App Inventor here: <https://appinventor.mit.edu/explore/ai2/quizme>

Ask students to generate a list of 5–8 questions and answers related to accessibility and inclusion.

Have students modify their quiz by changing the questions related to baseball to instead include their list of questions and answers.

Have students share their app and receive feedback from two people outside of the class. They can share their app with friends, family, or other teachers.

Have students explain how the use of lists manages complexity in their program.



Have students complete the How to Be an Ally for People with Disabilities Worksheet, found in the Student Workbook.

**Teacher Tip:**

Students can also change other aspects of their QuizMe app such as images.

**Check for Understanding:**

Ask students to explain an abstraction (possibly a procedure or list) that they created for their app to a neighbor. Ask them to explain how their abstraction managed the complexity of their app.

Ask students to complete this sentence, “I used to think that disabilities were _____. Now, I think that _____.”

**ISTE Standard - Global Collaborator:**

Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.



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How to Be an Ally for People with Disabilities

Create a quiz to share what we have learned about accessibility and inclusion with others.

Part 1: Using the same App Inventor login you created for the Translator App and in pairs, complete the QuizMe App Inventor Tutorial here: <https://appinventor.mit.edu/explore/ai2/quizme>

Part 2: After you have completed the tutorial, make a list of 5–8 questions and answers related to accessibility and inclusion.

QUESTIONS	ANSWERS
Sample Question: What are the four core principles of Web Content Accessibility?	Sample Answer: perceivable, operable, understandable, robust

Modify the QuizMe App to share your knowledge of accessibility and inclusion with others by replacing the questions and answers related to baseball with your list of questions related to accessibility and inclusion.

Part 3: Share your modified QuizMe App with two people outside of class and gather their feedback on your app.

NAME	RELATIONSHIP (FRIEND, FAMILY, TEACHER)	FEEDBACK: ANSWER ONE OF THE FOLLOWING: <ul style="list-style-type: none"> • What did you like about the app? • What did you learn about accessibility and inclusion? • What would you suggest I change to improve the app?

Part 4: Explain how the use of lists manages complexity in your program code by explaining why your program code could not be written, or how it would be written differently, if you did not use the list.

Sample Answer: The use of lists allows the program to function properly regardless of how many questions are added. Using the list means that we could also randomize the questions to make the game more interesting. If we didn't use lists, we would need to use variables for each question and answer. This would make the program code longer because we would need to have many more variables and our code would need to print out each question individually rather than being able to utilize loops and other control structures. The use of variables would also limit our ability to randomize the order of the questions. Also, we would probably need to limit the number of questions in the game.

Reflect: Investigate and Learn

Activity: Making Connections with Students' Lives

Provide opportunities for students to think about and record their individual and collective learning as they progress through the activities. Students should answer the following reflection question to prepare for Part 2: Action Plan: How can what you are learning in your AP[®] AP Computer Science Principles class support solutions that improve accessibility in your local and global community?

As they write, the following questions can help students shape their reflections:

- ▶ What are the social impacts of accessibility? Don't forget to think about potential harmful effects, as well.
- ▶ As you investigated existing programs addressing accessibility, what did you feel these programs do well, and what did you feel they could do better? Are there existing technologies that could be utilized to better support these programs?
- ▶ Who should be responsible for improving accessibility locally and globally? What role do technology companies play in advocating for and developing assistive technologies?
- ▶ What role do you think you could play in addressing accessibility locally and globally? What about in your own classroom?
- ▶ Based on what you learned about accessibility, and the actions others are already taking, what are five areas of need that you could address?
- ▶ What attracts you to these areas?
- ▶ What are some actions that you could take to address this issue?
- ▶ What excites you about these actions and the impact you can have?

Activity: Summarizing the Investigation

As part of their service project, students should summarize their learning to educate their classmates on the issue they have identified and investigated related to the issue of disability inclusion. Select an appropriate format for students to complete their summary. For example, students may make class presentations, design posters to hang in the classroom, write blog posts to share with the class, etc. Summaries may be supported by multimedia or print materials that synthesize and analyze the topic and issue on local and global levels.

When summarizing their investigation, students should keep in mind the following:

- ▶ What are the key takeaways from your investigation?
- ▶ How are the problems you investigated similar at local and global levels? How are they different?
- ▶ How are the solutions you investigated similar at local and global levels? How are they different?
- ▶ Why may your investigation be important to other AP[®] Computer Science Principles students?



ISTE Standard - Creative Communicator:

Students publish or present content that customizes the message and medium for their intended audiences.

Part 2: Action Plan

The Action Plan section is divided into four parts:

- ▶ Connect Learning
- ▶ Form Teams
- ▶ Develop Action Plan
 - Goal Setting
 - Understanding Approaches to Taking Action
 - Determining Clarity and Relevance of Goals
 - Measuring Success
 - Setting S.M.A.R.T. Goals
 - Identifying Resources and Creating a Network
 - Developing a Timeline
- ▶ Reflect

WE Service Framework



Overview for Part 2: Action Plan

Students apply the knowledge they acquired through the Investigate and Learn lessons to develop a plan through which they will address one local and one global service action.

Key Takeaways

- ▶ Completing a service action requires a set of skills, including working as a team and creating action plans.
- ▶ Action plans involve setting goals, identifying measurements of success, creating a timeline for each task, assigning specific responsibilities to each team member, and preparing to network with others to complete tasks.
- ▶ Three approaches to completing a service action are direct service, indirect service, and advocacy.

This Section Contains:

- ▶ Optional activities that you may choose to use with your class to deepen student understanding of particular elements of action planning.
- ▶ Templates that all students should complete to help them successfully meet the recognition criteria.

Connect Learning

Activity: Determining Interests

As a class, discuss the following:

- ▶ What issues related to your topic do you hear about on the news or read in newspapers and online articles? Why do you think these stories are covered by the media?
- ▶ What issues related to your topic do you think the general public is not aware of? Why do you think they are unaware?
- ▶ What issues related to your topic really bother you, even if you do not know a lot about them? Why are you bothered by these issues?
- ▶ If you were a world leader, what kinds of problems related to your topic would you tackle?



Teacher Tip:

Support students in determining their personal interests by incorporating an activity in which they think back to the problems and solutions they identified in Part 1: Investigate and Learn. Have students brainstorm the global and local issues they feel are most important and personally interesting to them.

Form Teams



It is recommended that students work in teams of four to six to plan and carry out their AP with WE Service projects. However, students may work individually or in any size group as approved by their teacher. Each team will decide on one local and one global action, and then create a plan that details how the actions will be achieved. Since each team will focus on a particular action, encourage students to form teams based on their interest in working on similar local and global issues. The more inspired and passionate students are about the issue they identify around the topic of access to clean water, the more creative they will be with the actions they develop. In order for students to pick teams, have students present the local and global issues they are interested in, then join forces with other students who are addressing similar issues.



Teacher Tips:

- ▶ When students first meet with their team, encourage them to create a contract so all members have a clear understanding of their own role and responsibilities, as well as those of the other members of the team. This will help to identify and establish group norms, including a plan and process for conflict resolution.
- ▶ Create a spreadsheet that the teacher can fill in with group members, including module (of choice), columns for check-ins, numbers, and agencies worked with. Teacher can also add a column to grade as each piece is completed.
- ▶ Instead of emphasizing skills and talents, ensure students are grouped based on the issue that is most important to them.
- ▶ If a big group forms around one issue, have students break into two groups and ensure they design different action plans on the same topic.

Resources to Support Forming and Working in Teams

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
<p>Gift + Issue = Change This activity helps students discover how they can use their talents and interests to carry out a service action.</p>	Use this activity to help students think about how they might individually contribute to an action that they feel passionate about.
<p>Finding Passion with the Issue Compass This activity helps students to brainstorm a list of local and global issues and to share their thoughts, opinions, and analyses about the topics. Students then choose one issue about which they are most excited to learn more and take action.</p>	This interactive activity can be used to align students into action teams according to their interests and talents.
<p>Exploring the Four Leadership Styles Every student can be a leader within their action team. This activity helps students to understand and value different kinds of leadership styles, and to discover their own strengths and challenges as a leader.</p>	Use this activity to help students better understand their individual strengths and the strengths of their teammates. By giving each person the power to be a leader, no one person will feel the burden of being responsible for the entire project.

Resources to Support Collaborating as a Team

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
<p>Creating a Safe Space It is important for each team to create a space in which everyone feels comfortable voicing their opinions. This activity asks team members to think individually and then as a group about what they will need in order to thrive within their team.</p>	Use this activity to help teams create guidelines around the way they interact and make decisions as a team.
<p>Drafting a Team Contract This activity walks students through how to create a contract so all members have a clear understanding of their own role and responsibilities, as well as those of the other members of the team.</p>	Use the contract to help students identify and establish group norms, including a plan and process for conflict resolution. This is both a key skill that students will learn and a proactive approach to problem-solving within a team environment. Use the results from the Exploring the Four Leadership Styles activity to help determine roles and responsibilities of each student in the group.
<p>Establishing Roles and Responsibilities Teamwork is a success when project tasks are divided equally and based on individual strengths.</p>	Use this activity to share with students how they can divide and conquer major areas of responsibility, and the roles they can each assume to make their service project both personally fulfilling and an overall success.

Develop Action Plan



After students have formed their teams, the next step is for teams to build out an action plan that:

- ▶ Identifies team goal(s)
- ▶ Establishes their metrics of success
- ▶ Identifies their network and required resources
- ▶ Creates a timeline for completing their actions by sequencing necessary tasks and identifying individual roles and responsibilities



Teacher Tip:

Be sure teams create goals that are specific and measurable. In addition to meeting the Recognition Rubric requirements, this will allow students to report on the impact of their project in Part 4: Report and Celebrate.

Activity: Goal Setting

Each team must create a goal for the team’s action. This goal will need to:

- ▶ Be clear, measurable, and informed by the team member’s needs assessment
- ▶ Incorporate one global and one local action
- ▶ Achieve direct service, indirect service, or advocacy.

Help students generate and decide on a team action goal using the following activities

Activity: Understanding Approaches to Taking Action

Every great plan begins with establishing clear goals. But first, help students understand the types of actions their team might take through their action project. There are three approaches, generally speaking, to taking action:

- ▶ **Direct service:** Personally engaging with and providing hands-on services to those in need (usually in conjunction with an organization).
- ▶ **Indirect service:** Channeling resources to the needs of a community—locally, nationally, or internationally.
- ▶ **Advocacy:** Educating others about an issue to increase visibility and follow up with an action that focuses on enacting change.

Resources and Ideas to Support Selecting a Type of Service

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
<p>Tips on Developing Direct Service Action Ideas Get ideas and resources on how to personally engage with and provide hands-on services to those in need (usually in conjunction with an organization).</p>	<p>Use the following resources to show students how to create their own ideas or connect with existing ones that they can expand on:</p> <ul style="list-style-type: none"> • Tips on Developing Direct Service Action Ideas • WE Volunteer Now Campaign
<p>Tips on Developing Indirect Service Action Ideas Get ideas and support on how to channel resources to the needs of a community—locally, nationally, or internationally.</p>	<p>Use the following resources to show students how to create their own ideas or connect with existing ones that they can expand on:</p> <ul style="list-style-type: none"> • Tips on Developing Indirect Service Action Ideas • WE Go Green campaign • WE Scare Hunger campaign • WE Are Rafikis campaign • WE Create Change campaign
<p>Tips on Developing Advocacy Action Ideas Get ideas and resources on how to educate others about an issue to increase visibility and how to follow up with an action that focuses on enacting change.</p>	<p>Use the following resources to show students how to create their own ideas or connect with existing ones that they can expand on:</p> <ul style="list-style-type: none"> • Tips on Developing Advocacy Action Ideas • Developing a Deep Understanding of Your Issue, and Messaging Your Message • Ensuring Message Credibility • Spreading the Word (Communications Strategies and Communications Plan Worksheets and Templates) • Practice, Practice, Practice • WE Are Silent campaign



Approaches to Taking Action Information Sheet

(1 of 1)

DIRECT SERVICE

WHAT IS IT?	Personally engaging with and providing hands-on service to those in need (usually in conjunction with an organization).	
EXAMPLE GOAL	By the end of the semester, we will support a local food bank and shelter by packing and serving food to people in the community. We will also visit our neighboring elementary school and teach a lesson on food insecurity in our community.	
ACTIONS	<ul style="list-style-type: none"> Reach out to local shelters and food banks to arrange a day for the class to visit and provide hands-on support Once a date has been decided, make sure students all have permission to travel to the food bank (if during school hours) 	<ul style="list-style-type: none"> Connect with teachers/administration at local elementary school and arrange to visit a classroom to teach a lesson to young students on food insecurity Create and print worksheets to use with younger students

INDIRECT SERVICE

WHAT IS IT?	Channeling resources to the needs of a community—locally, nationally, or internationally.	
EXAMPLE GOAL	By the end of the year, we will create a storage and donation system for local families in need, where they can access furniture and other household items. We will develop a system for donations, pick-ups, and inventory.	
ACTIONS	<ul style="list-style-type: none"> Conduct research into which items are most needed by community members (e.g., bed frames, dining tables, household goods, etc.) Reach out to local businesses to try to get a storage space donated Connect with school social workers/administration to gain their support Put up flyers around school and in the community, asking for donations (list specific items needed), including instructions on how/where to donate 	<ul style="list-style-type: none"> Develop an online database for tracking donations and pick-ups, and maintaining inventory Share pick-up information with local shelters, churches, community centers, etc. Share the donation system with school social workers, so that they can maintain the project in future years

ADVOCACY

WHAT IS IT?	Educating others about an issue to increase visibility and following up with an action that focuses on enacting change. Actions around advocacy often look like raising awareness, but without a strong call to action within the initiative as a whole. Educating others is not considered service in and of itself.	
EXAMPLE GOAL	Through an informative art piece, we will educate our school community about the waste created by single-use plastic water bottles, and the impact they have on the environment. Then, we will sell reusable water bottles at school, and the proceeds from the sale will go toward clean water projects in developing countries.	
ACTIONS	<ul style="list-style-type: none"> Research the impact of single-use plastic water bottles around the school and in the local community Plan out and create a 3D sculpture that incorporates informative text on the issue of single-use plastics Seek permission from school administration to display the piece in a common area of the school 	<ul style="list-style-type: none"> Design and order water bottles to sell at school Research and select an international organization that focuses on clean water projects Organize a selling schedule for the water bottles, donate profits

Activity: Determining Clarity and Relevance of Goals

In their teams, students should now begin to develop their goal(s) for their action plan. Setting effective goals is a more difficult skill than most people imagine, but once students learn to employ one or more techniques for developing clear goals, it will serve them in all endeavors. Have students split up into their action teams and instruct them to brainstorm actions they would like to take, sharing from their personal reflections from the previous section, and drawing from their previous investigation and research, along with the needs assessment and reflections. Encourage students to use the 5Ws (what, where, when, why, who, and how) to express their overarching goal(s) and to be as clear and specific as they can.

As they write drafts of their goal(s), they should ask themselves the following questions to assess the clarity and effectiveness of their goal:

- ▶ Is this goal specific enough so that we know exactly what our team will accomplish?
- ▶ Can we measure whether or not this goal was fully accomplished?
- ▶ Is it achievable within our project period?
- ▶ Is it relevant to the social issue we are aiming to address?
- ▶ Do we know the deadline by which it will be accomplished?

Activity: Measuring Success

As part of goal setting, establishing Measurements for Success is an important way of knowing if the goal has been achieved. Take time to discuss measurement in a bit more detail. Measurement is an aspect of the goal-setting exercise that students should understand before they begin executing an action plan. Students will need to understand how they will measure positive outcomes so that they understand what success looks like and how they will know they have achieved their goal. Is it based on the number of people they have reached through their actions? This will require teams to keep track of numbers. Or are they also looking at how the individuals reached have been affected? A survey with written answers (or multiple choice options) could do the trick. Share with students that measuring success can take two forms:

- ▶ Qualitative data is usually descriptive data that provides insights into what/how people think or feel. Qualitative data is harder to analyze than quantitative data.
- ▶ Quantitative data usually provides a numbers-based measurement (with associated units) such as quantity, amount, or range.



Teacher Tip:

Have teams define quantitative and qualitative data sets for their action plan; then brainstorm a list of each that applies to their action project. Remind students that establishing their criteria for success and the corresponding metrics is an ongoing process. As they dive deeper into their action planning and execution, it will become clearer for students what kind of data they will need and how they will obtain it. The information may be collected by multiple team members. However, it is good to designate at least one person to any (and each) of the methods on their list.

Activity: Setting S.M.A.R.T. Goals

A S.M.A.R.T. goal is Specific, Measurable, Attainable, Relevant, and Time-bound.

Before your group starts their campaigns or actions, you're going to need a good plan. By having a plan, you will have the means to establish a defined goal and a reliable way to reach that goal. Brainstorming ideas will allow you to determine clarity and relevance for your service project. Your criteria will serve as a guideline to ensure that you have a way to evaluate your outcome and see whether or not you've achieved what you set out to do. So whether your group is trying to hit a particular fundraising total, organize a huge event with a certain number of attendees, or reach a target audience with awareness-raising speeches, you'll want to start with a goal and a plan. The surest way to do this? Build a S.M.A.R.T. goal.

Resources on Goal Setting

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
Determining Clarity and Relevance of Goals This is a brainstorming activity that guides students through big picture ideas and critical thinking as they begin to plan their service project goal.	Use this activity to help students sort through all the ideas they will come up with before they decide on the goal around which they will develop their action plan.
Establishing S.M.A.R.T. Goals This activity guides students through key steps of S.M.A.R.T. (Specific, Measurable, Attainable, Relevant, Time-bound) goals.	S.M.A.R.T. goals help students ensure that their team sets a "right-sized" and relevant goal to guide their action planning throughout this experience. This skill set, once learned, is one that students can apply to a myriad of other challenges and settings.

Resources and Ideas to Support Measurements of Success

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
Creating Measurements of Success Reporting success comes down to students' ability to collect the right data and information. This activity helps students think about the outcomes of their project as part of their goal-setting and action-planning work.	Help students understand the difference between qualitative and quantitative data, and how to go about creating and establishing the right measures of success for each team's project.
Collecting Evidence and Artifacts This activity supports students with gathering the information they will need to help report on the outcomes of their service projects.	Use this resource to help students determine the type of data they need to collect, and then how they can go about gathering the info they need. The data and information students gather will feed into their team executive summary at the end of the overall module.
Creating Surveys and Feedback Forms Creating a survey and/or a feedback form means identifying the criteria on which you want to collect data and report the outcomes.	Use this resource to show students how they can create their own surveys and feedback forms by considering all the relevant data and information they will need. Sample surveys and forms will provide further guidance.

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Activity: Identifying Resources and Creating a Network

As students develop their goals and measures of success, they will start to identify what they need to execute their action plans. This will include creating connections with people, such as within (but not limited to) the school, your community, different organizations and businesses, topic experts and speakers, media outlets, the blogging/social media community, etc. These people will serve as supporters and amplifiers, as well as providers of information and resources.

For this latter part, students will need to identify the resources they need to accomplish their goals. This can include (but is not limited to):

- ▶ Facts and statistics (found through research or materials from other organizations)
- ▶ Tools and supplies (this list can be endless, but may include things like card stock, paint, tables, chairs, microphones, water buckets and sponges, labeled boxes to collect items, collection jars, etc.)
- ▶ Stories of individuals who benefit from the services of the organization
- ▶ Access to space and/or venues
- ▶ Methods and resources for producing necessary materials or media

Activity: Developing a Timeline

A key to success in action planning is developing a careful timeline. Not only will it help students allot the appropriate time to each task and keep them on track, but breaking up a large task or action into smaller, more manageable tasks will help them address all the necessary details in a timely fashion.

Resources to Support Identifying Resources and Creating a Timeline

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.



Teacher Tip:

Emphasize to students that timelines are meant for them to have a date to work toward. When they begin working with organizations the timelines will need to be flexible.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
<p>Creating a Timeline Creating careful timelines is a key to success in action planning.</p>	<p>This activity will help students allot the appropriate time to each task and keep them on track. It will also help them break up a large task or action into smaller, more manageable tasks to effectively help them address all the necessary details in a timely fashion.</p>
<p>Identifying and Sequencing Tasks Creating timelines means thinking through the details and plotting the relevant tasks that get students from point A to B and onward on a project.</p>	<p>This activity will help students think about each step of their action project and how to plot each step as an actionable task in a timeline.</p>
<p>Identifying Task Owners This activity shows the difference between roles and responsibilities set out at the beginning of a project with that of an owner of an individual task.</p>	<p>Use this activity to show students how to effectively divide tasks amongst team members. Some tasks will be a part of each individual's overall role and responsibilities, and some will be based on personal interests, skills, and strengths.</p>
<p>Identifying Resources and Creating a Network This activity highlights that through the process of planning and taking action, students will meet and be in touch with many people. This network of people will grow quickly and may be valuable beyond their projects.</p>	<p>Use this activity to help students create a networking map to help them keep track of the people they will be working with through their action plan. They can also document the resources they will need to access, either through their network or as an item they will need to source separately.</p>



Activity: Creating the Action Plan

After working as a team to identify team goals, establish metrics of success, determine their network and required resources, create a timeline for completing their actions, and identify individual roles and responsibilities, students are ready to put all their ideas in writing. By creating an action plan, all team members are committing to support their team in carrying out the proposed project(s).



Teacher Tip:

Have students create the local action plan first, complete the hours, and then have them complete a separate plan for their global hours.

Please keep in mind that there are no hours requirement that you need to meet, but this step will help students understand the time they invested in their projects.



- ▶ Have students use the Avoiding the Five Action Planning Pitfalls Tip Sheet, found in the Student Workbook, to review common mistakes made during action planning and to ensure these have been avoided.
- ▶ Have students use the Creating an Action Plan worksheet, found in the Student Workbook, to help build out their action plan.

Reflect



After completing their action plan, students should individually reflect on their teamwork and action planning thus far. Teams should then share their plan, describe how the project addresses the issue at local and global levels, and make connections to the AP[®] course.

Activity: Reflecting on Action Plan

Provide students with questions to help them reflect on their experiences working as a member of a team and creating an action plan.

- ▶ What is the issue that your team is taking action on? Why is this issue important to you? Why is this issue important to your team?
- ▶ What action is your team planning to take? How does this action fulfill an opportunity identified in your needs assessment?
- ▶ What are you most passionate and excited about in your action plan?
- ▶ Why is goal setting so important, and how can you imagine using goal-setting techniques in your life, future action plans, or other activities? How does your action goal relate to your AP[®] course?
- ▶ What kinds of leadership qualities do you hope to develop as you continue to take action?
- ▶ Why is teamwork so essential to carrying out effective service projects to address local and global issues?
- ▶ Having planned to make a difference on local and global issues, what have you learned about your ability to create social change?



Check for Understanding:

Through this reflection, students should highlight why the issue is important to them, how they can make a contribution, why certain aspects of action planning (such as goal setting) are important life and academic skills, what connections they have made to their AP[®] course, and what they have learned so far.



Teacher Tips:

- ▶ As part of their AP[®] with WE Service project, students will need to track their work. Look ahead to Part 4 to review and share expectations with students so that they are keeping records, taking photos, collecting documents, and tracking data.
- ▶ Educating others about their local and global issue is a great way for students to share their learning. Invite teams to hold an educational event or campaign to raise awareness about the social issue they have studied, which hopefully will have the power to compel their class (or community) to action. Students should consider what format they would like to use, based on their action. It may be a public speech at their school or in their community, a newspaper article, a website, a social media campaign, a short story, an artistic display, etc. It is also a great way to share the ideas they have developed in their action plan and how they will take action on the issue. This is not the action in itself but rather the education on the issue and the action plan.

Resources to Support Deeper Reflection and Educating Others

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
Perfecting the Elevator Pitch This activity helps students understand that what they say about their actions has the potential to do several things, including inform, appeal to emotions, persuade, and compel others to take action themselves.	Use this activity to help students create the proper “elevator pitch” for their project as they think about how to create a compelling message about what they have learned about their issue and what they will do about it.
Developing a Deep Understanding of Your Issue and Messaging Your Message This activity highlights how educating others about an issue means students must be knowledgeable about it.	Use this activity and case study to show students how to think critically about their issue as they learn to ask informed and thoughtful questions, and assess the gaps in their knowledge and the information they need to know.
Ensuring Message Credibility In order to gain support, every team’s message should be able to stand up to the critics they may face. This activity will help students ensure the credibility of their message.	Use this activity to have students run three checks on the credibility of their message: creating an annotated bibliography, fact checking their message, and presenting to the class for a peer-review and question period.
Spreading the Word A message is only powerful if it reaches the right people. This activity, along with accompanying worksheets and templates, guides in developing effective communications strategies and a communications plan.	Use this activity to have students brainstorm various communications methods and assess each one’s effectiveness. Then, they will develop a communications plan around their selected method to detail who their message is intended for, how the message will be communicated, and when it will be delivered.
Practice, Practice, Practice This activity highlights how public speaking is a powerful force that can break the silence and raise awareness of difficult issues.	Use this activity and case study to have students read, listen to, or watch some examples of famous speeches to identify how the speaker uses the three I’s—Influence, Involve, and Inspire—with their audience.



Use the Reflect: Action Plan worksheet in the Student Workbook to reflect on what you have learned.



Part 3: Take Action

The Take Action section is divided into two parts:

- ▶ Connect Learning
- ▶ Re-Inspire and Reflect

WE Service Framework



Overview for Part 3: Take Action

As students take action, they will be equipped with tools to navigate obstacles, mitigate conflicts, collect evidence, and record their actions, while also learning how to maintain their drive and inspiration.

Key Takeaways

- ▶ Effective teamwork is strengthened through abilities to navigate obstacles and overcome conflicts.
- ▶ The impact of an action can be measured by the collection of evidence and recording actions.
- ▶ Re-inspiration is important when caught up in the details.

This Section Contains:

- ▶ Templates that all students should complete to help them successfully meet the recognition criteria.
- ▶ Optional activities that you may choose to use with your class to deepen student understanding of particular elements of taking action, effective teamwork, and recording actions.

Resources on Determining Effective Teamwork, Navigating Obstacles, and Overcoming Conflicts

In Part 3: Take Action, you will use these resources to help students with practicing positive teamwork, navigating obstacles, and planning for contingencies as they begin to take action.

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
<p>Ezra Frech’s Story Ezra Frech loves to play guitar and a ton of sports. Born with one finger on his left hand and a lower leg that was curved, he had surgery at age two to remove the lower part of his leg and transplant the big toe onto his left hand.</p>	<p>Ezra’s story (available at https://www.youtube.com/watch?v=KUqmJzoQQYQ) highlights perseverance and tenacity. On losing his leg and gaining a transplanted thumb, he says, “And this hasn’t slowed me down at all!” He is his school’s starting quarterback and can shoot hoops for days.</p>
<p>Practicing Positive Teamwork and Conflict Mediation Maintaining a positive and enthusiastic team can be difficult in the midst of long sessions of work and preparation. Conflicts are likely to arise, and understanding techniques for conflict resolution is an important lifelong skill to have.</p>	<p>Use this tip sheet and worksheet to help students understand conflict-mediation techniques and the power of constructive feedback to keep team dynamics positive and ensure their teammates feel supported and appreciated.</p>
<p>Navigating Obstacles No matter how much work and preparation goes into an event, obstacles may arise at any point, acting as a roadblock to success.</p>	<p>Help students gain a better understanding of how others have successfully navigated and overcome obstacles using this case study on Spencer West, a motivational speaker and author of <i>Standing Tall: My Journey</i>, which underscores teamwork and focus on goals.</p>
<p>Planning for Contingencies This means students are thinking ahead by looking at possible issues that might come up, and planning for possible solutions accordingly.</p>	<p>This activity helps students work through the process of proactively identifying potential issues and considering practical solutions so that they can plan ahead.</p>

Connect Learning

Activity: Student Log Sheet

In addition to the information, artifacts, analyses, and reflection pieces that you collect and complete, you will need to keep track of time spent on your action projects, reflect on your experiences, and collect the appropriate verification where needed. As you reflect, some of the things you may think about include:

- ▶ What did you accomplish today?
- ▶ What (if any) were the major successes or big wins?
- ▶ How can you build on these successes?
- ▶ What (if any) were the setbacks, minor or major?
- ▶ What is your plan to mitigate or resolve these issues?
- ▶ What do you plan to accomplish tomorrow/next class/next meeting?
- ▶ How are you feeling about the progress of the action so far?
- ▶ Did you collect the qualitative data you set out in your action plan? What are the testimonials telling you so far (if applicable)? Are there any tweaks or changes you need to make with your action plan?
- ▶ Did you collect the quantitative data you set out in your action plan? What are the numbers telling you so far (if applicable)? Are there any tweaks or changes you need to make with your action plan?
- ▶ What is still missing and how will you get the information you need?
- ▶ How did your team pull together? What were your teamwork successes? What conflicts or obstacles did you resolve or overcome? How can you be stronger as a team?



Have students use the Student Log Sheet, found in the Student Workbook, to help record and keep track of their activities and reflections.

Re-Inspire and Reflect



In the process of carrying out an action, team members will often lose inspiration or momentum. Help students reconnect with their original motivation for taking action to empower them as change-makers.

Individually, ask students to reflect on their own story as someone who is interested in changing the world through action. Provide them with the following questions to reflect on their story as an agent of change.

Activity: Reflecting on Take Action

Provide students with questions to help them reflect on their experiences of taking action as a team.

- ▶ How will you continue the work that you and your team started with this project?
- ▶ Changing the world is hard work, and a lot of fun too! What are the top three lessons you have learned during your service project?
- ▶ What is your story as an agent of change?

Resources on Re-Inspiration

Resources are available in the AP with WE Service Program Guide:

<https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
<p>Craig Kielburger's Story When Craig first learned about child labor at the age of 12, there was no way for him to get involved and make real change as a kid. So he set out on his own to free children from poverty and exploitation, but freed his peers at home from the idea that they had to wait to change the world.</p>	<p>Use the various resources—including videos, articles, and books Craig has written—to inspire students with the knowledge that passion and determination can truly change the world. Access the resources here: https://www.we.org/en-CA/about-we/about-us.</p>
<p>Ally Del Monte's Story Every year, 3.2 million kids are bullied. Sixteen year-old Ally Del Monte was one of them, but she decided to fight back by motivating others to be proud, be strong, and, most of all, be brave.</p>	<p>Use Ally's story (available at https://www.youtube.com/watch?v=QhHLekYrrp8) to inspire students and spark a conversation. Ally talks about bullying and its terrifying impact, but she also talks about overcoming the bullying and leading by example.</p>
<p>Razia Hutchins and Maurice Young's Story The I Am For Peace movement started as a neighborhood march against violence in the south side of Chicago. Now an annual event, it has gone global, thanks to champion youth Razia Hutchins and her partner in peace, Maurice Young.</p>	<p>Use Razia and Maurice's story (available at https://www.therenewalproject.com/fighting-against-chicagos-gun-violence-with-peace/) to inspire students about how a passion-driven initiative can make a life-altering impact—on those who lead the initiative as well as those who will be inspired to join.</p>

Part 4: Report & Celebrate

The Report and Celebrate section is divided into three parts:

- ▶ Connect Learning
- ▶ Celebrate
- ▶ Complete Final Summary and Reflection

WE Service Framework



Overview for Part 4: Report and Celebrate

Students will compile and showcase their work. They will then celebrate their accomplishments and look ahead at ways to continue to sustain their actions.

Key Takeaways

- ▶ Devoting time to serving the greater community can positively affect the individual and the community.
- ▶ Service learning enables students to make local and global connections to AP[®] course content.

This Section Contains:

- ▶ Templates that all students should complete to help them successfully meet the recognition criteria.
- ▶ Tables containing optional activities that you may choose to use with your class to deepen student understanding of particular elements of Report and Celebrate.



Connect Learning

Activity: Understanding the Purpose of Showcasing Work

Discuss the following:

- ▶ Why is it important to put together evidence of your service project?
- ▶ What is the value of showcasing your work?
- ▶ What are the different ways in which portfolios can be presented?
Are some ways more effective than others? How and why?
- ▶ How can a portfolio be used to educate, inform, and guide other students in creating their portfolios?

Activity: Collect Artifacts



To showcase their work, instruct students to consider including elements they would find interesting and helpful to have if they were just beginning their action. What would they include to help students who are only beginning their action planning?

Putting Together a Portfolio of Artifacts

A portfolio is a collection of work, material, and achievements that you believe best explain and represent your AP® with WE Service work. It can take one or more forms:

- ▶ An online presentation through Prezi or PowerPoint
- ▶ A blog or a website, or any other online tool that you may choose
- ▶ Video presentation
- ▶ Physical portfolio displayed on a presentation board, in a binder or scrapbook, etc.



Focus Area Alert:

Have students describe the steps and actions they took to effect change. They should describe any policies, regulations, or laws that could be implemented and enforced to facilitate continued change in this area.

Celebrate



Optional Activity

Amazing actions, incredible impacts, and outstanding student leadership deserve to be celebrated. It is important to honor the work students have done and recognize the impact they have had on their communities, the nation, and the world. As a class (or perhaps a school, if other AP® with WE Service courses exist in the school), organize a celebration that fits the actions that the students have taken. A few celebration ideas include:

- ▶ WE Day
- ▶ A school-wide assembly
- ▶ A project fair for the whole school to visit
- ▶ An outdoor cinema-style documentary screening
- ▶ Poster exhibition
- ▶ School newsletter, newspaper, or special-edition magazine

Do not forget to share and celebrate over social media:

Post on [facebook.com/WEmovement](https://www.facebook.com/WEmovement) • Tweet [@WEmovement](https://twitter.com/WEmovement), [#WEday](https://twitter.com/WEday), [#APWEServe](https://twitter.com/APWEServe)



Teacher Tip:

Students have seen what they can accomplish as small groups, so put together all of their numbers so they can see the change they affected as a whole group.

Resources on Celebrating...

Resources are available in the AP with WE Service Program Guide: <https://apcentral.collegeboard.org/pdf/program-guide.pdf>.

RESOURCE AND DESCRIPTION	HOW TO USE THIS RESOURCE
... At a School-Wide Assembly	School assemblies are a popular way to showcase and celebrate collective achievements. Use the sample road map in this tip sheet to organize a memorable school assembly.
... Through Social Media	Social media is a great way to celebrate all of the amazing work your class is doing. Join the conversation online and create fun, engaging content to share your big ideas.
... Through a Project Fair	A project fair allows for intimate and meaningful interaction between teams and the rest of the student body, allowing other students to explore and understand the different service actions at their own pace. This tip sheet will provide thoughts and ideas on organizing a project fair.
... With a Documentary Screening	Why not make a final documentary of the different action projects and hold a school-wide screening? This tip sheet will help you get started.
... With a Poster Exhibition	Posters can convey a lot of information and emotion through art and concise copy. It is a great team exercise as part of their portfolios and a terrific way to share and celebrate their successes within the school and even the community.
... With a Special Publication	Put together a class publication that shares the highlights, learning, and successes of the teams through individual and/or team articles, photo essays, and editorials. This tip sheet will get you started.

Celebrate with Social Media

Social media is a great tool to show all the amazing work your students are doing! Join the online conversation and create fun, engaging content to share your big ideas. Whether you will be running your group's accounts or teaching your students how to run social media in a fun, safe, responsible, and effective way, these tips will provide creative ways to amplify your projects in the digital space!

Getting connected. This is the best place to get started. Make it a team effort and tell your school that you'll be posting all about the amazing work they'll be doing. Grow your network by adding group members and students on all of your social media accounts. Stay digitally active and keep up the conversation online! Engage with posts using likes and motivate each other with comments.

Take great photos. Eye-catching visuals are an absolute necessity when it comes to social media! Bright backgrounds, daylight, and big smiles are the best combination for an awesome picture. Mix it up by changing up settings. (One photo can be in a classroom; another can be outside!) This will add variety to your feed and make it much more interesting.

Share in a timely fashion. Want to know a fact about social media? It only thrives if people see it. Post at times that will guarantee views. Sharing during lunch break and right after school will ensure your content gets the most visibility.

Updates! Does your latest project include a goal you're trying to reach? Keep your school updated on how close you are! Provide updates as soon as you get them, to keep your students and teachers in the know. That post might be the extra push you need to achieve your goal.

Use hashtags. Craving inspiration to spice up your campaign? See what others are doing by looking up the hashtag.

Gifs! Take your feed to the next level with these short animations. Download a GIF maker from your preferred app store and fuse your photos together to liven up your newsfeed.

Tag—you're it! Here's a fun way to get your school involved: play a game of digital tag. Once you've posted, have students tag five friends and challenge those friends to tag and share with five others. You'd be surprised how fast word gets around! (PS: This works even better if you all use the same hashtags in your captions.)

Create a challenge on the WE Day app! Amplify your latest project with a challenge on the WE Day app! Not only will your friends be psyched to take it, it'll also be available for all app users so they can contribute to your project! Make it quick and related to your project, and amplify it further by sharing it on your social channels!

Share with us. We love seeing how your projects are going! Tag your posts with [#WEday](#), [#WESchools](#) and [#APWEServe](#). They might just get featured!

Complete Final Summary and Reflection



Activity: Complete Final Executive Summary

Once students have completed their action, submitted their evidence, and celebrated their work, students may complete an executive summary as a team. The executive summaries offer a snapshot of the team's outcomes based on:

- ▶ Summary of the team's work and individual contributions
- ▶ Analysis and highlights of evidence collected
- ▶ Explanation of the project impact and its significance within a larger context
- ▶ Summary of what they learned about their AP[®] course through the service project

Activity: Reflect on the Overall Service Experience

Individually, students complete a final reflection that describes their overall service experience. Students reflect on their thoughts at the start of the project and how they feel they have grown over the course of their service work. What do they now understand about the role of service and active citizenship, especially as an application of their learning?

Activity: Record and Reflect

Using the following questions to guide your writing, reflect on the overall action project, which will inform the development and assembly of your portfolio.

Overall, in this action project:

- ▶ What were your most important successes as a team, and what were the important factors that helped you accomplish those successes?
- ▶ What obstacles did your team overcome and what strategies were important in navigating those challenges?
- ▶ What was your favorite moment in carrying out your action?
- ▶ What are you most proud of?
- ▶ If you could go back to the start, what advice would you give yourself or your team? Is there anything you would do differently?
- ▶ How is your community/the nation/the world a better place because of your action?
- ▶ How have you developed as a global citizen in taking action? What plans do you have to continue your work as a change-maker?



Completed the module? Register to become a WE School!

Congratulations on implementing and completing your service projects. Did you know that if students at your school complete at least one local and one global action, your school is eligible to become a WE School? Spread pride throughout your school and unlock unique opportunities by starting a WE Schools group! Check out [WE.org](https://www.weschools.org) and look for the WE Schools application.

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Andrea Sluchan, Associate General Counsel

Resources

Getting to Know the Topic:

“People with Disabilities are the Largest Minority Group in the US,” Invisible Disabilities Association, <https://invisibledisabilities.org/coping-with-invisible-disabilities/disability-benefits/disabilities-largest-minority-group-us/>

“Students with Disabilities,” NCES, https://nces.ed.gov/programs/coe/indicator_cgg.asp

“CDC: 1 in 4 US Adults Live with a Disability,” CDC, <https://www.cdc.gov/media/releases/2018/p0816-disability.html>

“Children with Disabilities Are More Likely to Be Out of School,” UNESCO, <http://uis.unesco.org/en/news/children-disabilities-are-more-likely-be-out-school>

“Disability and Health,” WHO, <https://www.who.int/en/news-room/fact-sheets/detail/disability-and-health>

“Disability Inclusion,” World Bank, <https://www.worldbank.org/en/topic/disability>

“Factsheet on Persons with Disabilities,” United Nations, <https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities.html>

Additional Resources:

Curricula on Web Accessibility from W3C <https://www.w3.org/WAI/curricula/>

Disabled World — Categories of disability <https://www.disabled-world.com/disability/types/#mobility>

WHO Fact Sheet: Disability and Health <https://www.who.int/news-room/fact-sheets/detail/disability-and-health>

CDC Report: Disability and Health Disability Barriers <https://www.cdc.gov/ncbddd/disabilityandhealth/disability-barriers.html>

Accessibility - W3C <https://www.w3.org/standards/webdesign/accessibility>

2010 ADA Standards for Accessible Design https://www.ada.gov/2010ADASTandards_index.htm

Using Technology | American Foundation for the Blind <https://www.afb.org/blindness-and-low-vision/using-technology>

Yes I Can: A Social Inclusion Curriculum for Students with and Without Disabilities <https://eric.ed.gov/?id=ED407774>

Researching Disabilities Worksheet from Teaching Tolerance http://www.tolerance.org/sites/default/files/general/tt_researching_disabilities.pdf

Accessibility Basics <https://www.usability.gov/what-and-why/accessibility.html>

Subtitle Video — Add Subtitles Online — Kapwing <https://www.kapwing.com/subtitles>

Notes

Notes

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