

Lesson 1- Computational Thinking & Problem Solving

Focus Question: **What Makes A Successful Problem Solver & CS Learner?**

Objectives		Suggested Duration: 30 minutes	
In this lesson, students will discover computational thinking and how to solve a problem by breaking it down into smaller parts and creating steps to solve it.			
Students will be able to...			
- Break down a task into small parts. - Complete steps to solve each part of a problem. - Identify characteristics of a successful CS Learner and the skills that help them solve problems. - Identify decomposition and how it is useful in problem-solving.			
NYS Computer Science & Digital Fluency Standards			
K-1.CT.4 Identify a problem or task and discuss ways to break it into multiple smaller steps. K-1.CT.5 Recognize that the same task can be described at different levels of detail. K-1.CT.10 Collaboratively create a plan that outlines the steps needed to complete a task. K-1.DL.2 Communicate and work with others using digital tools. K-1.DL.4 Use at least one digital tool to create a digital artifact.			
Materials/Digital Tools/Resources/Links		Technical Requirements	
Slide Deck Jamboard Interactive of Slide Deck Brainpop Jr. Video Flipgrid Moby Treasure Hunt Student Worksheet-K Moby Treasure Hunt Student Worksheet-1st - Crayons or markers for coloring Computational Learner Poster		Instructor: You will need a computer with internet access and the ability to display it to the class via a smartboard or projector or flat panel. Student: Access to Chromebook or tablet to complete flipgrid extension activity.	
Vocabulary			
Computer Science - using the power of computers to solve problems. Computational Thinking: a way to understand a problem by breaking it down into smaller parts and creating steps to solve it. Strategies include decomposition, pattern matching, abstraction, algorithms. Problem-solving (Debugging)-Finding and fixing a problem or improving ideas. Decomposition-breaking down tasks into smaller chunks make them easier to solve. Persistence - trying again and again, even when something is very hard.			
Preparation		Assessments	
- Preview the movie Computational Thinking to plan for adaptations. - Open slide deck and/or Jamboard. - Print student worksheets for independent work.		Lead a discussion, check for understanding during Wrap-up, or examine students’ worksheets to assess their understanding of the lesson’s core concepts. Review Flipgrid responses to gain insight of individual understanding.	

Lesson Warm-Up

Ask students “When you are faced with a problem, how do you fix it?” and discuss varied student responses.

Introduce students to computational thinking by showing the [Brainpop Jr. Computational Thinking Video](#)

Ask “How do Moby and Annie problem-solve?”

- Step#1: STOP & THINK (Stop and think about the problem)
- Step#2: BREAK IT DOWN (Break down the problem to identify smaller parts-**Decomposition**)
- Step#3: MAKE A PLAN (Take notes of your ideas to fix smaller parts of the problem. This will help to solve the main problem)
- Step#4: TEST & MAKE IMPROVEMENTS (Identify mistakes & Debug)

Ask yourself: How can I change something to make it better?

- Step#5: STAY PATIENT & KEEP TRYING (You can always go back to your ideas to make them better)

Lesson Activity & Procedure

1. Slide Deck/Jamboard Whole Class Activity

Using the flat panel to facilitate whole-class instruction, have students volunteer to participate by dragging and dropping digital manipulatives for each activity.

2. Independent Work

Students will practice concepts learned independently by listening to detailed directions/instructions in order to complete the Moby Treasure Hunt Student Worksheet.

3. FlipGrid Response- Extension of Lesson

Students will record a video response explaining what it takes to be a successful CS learner by explaining the steps to becoming a great problem solver.

Lesson Wrap-Up

Check for Understanding

Have students volunteer to show their worksheets and explain what they learned about problem-solving and how they followed the steps to get Moby to the treasure.

Extensions

Students can create individual **Reflection Responses using Flipgrid** (code: **a9fcf918**) [QR CODE LINK](#)

- What steps can you take to build your problem-solving skills?
- Describe the characteristics of a successful CS learner?

Differentiation/Accommodations

Engagement Options

- Have students watch the video(s) on their own or deliver to smaller groups to encourage discussions
- Use Pear Deck or Nearpod to increase engagement and allow for multiple means of response.

Representation Options

- Record your screen for the modeling parts and share it with students afterward.
- Use Google Slide add ons such as Pear Deck and Nearpod to allow for multiple entry points into the lessons based on student learning preferences (ex. Visual, auditory, etc.)

Action and Expression Options

- Assign the slide deck and digital worksheets to students for asynchronous completion.
- Have students respond in Seesaw journal (based on their level) that way you can provide feedback.