Professional Development Situation: Virtual Training
Skill Focus: Giving Youth Control
Time Required: 60 minutes

CREATING MY PROJECT

Participants will learn how to provide opportunities for youth to direct and manage their own learning and explore strategies to help young people learn to be problem solvers and contributors to computer science.

Agenda

Welcome, introductions and explanation of Zoom – 10 minutes
Hands-On Learning – 20 minutes
Rubber Duck Idea – 10 minutes

- [Rubber Duck Story](#)

See the skill in action – 10 minutes

- [Where Are You Stuck?](#) video-based learning module

Conclusion – 10 minutes

Materials

- Documents/Links
    - [Poster on Computation Thinking Concept](#)
    - Rubber Duck Story Video: https://www.youtube.com/watch?v=huOPVqztPdc
    - Where Are You Stuck? Video-Based Learning Module: http://www.click2sciencepd.org/learning-modules/where-are-you-stuck
    - K-12 Computer Science – Computational Thinking: https://k12cs.org/computational-thinking/

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- For Presenter:
    - Computer with internet connection, camera and speakers
    - Paper and pens/pencils for notes
    - Headphones are recommended
- For Participants:
    - Computer with internet connection, camera and speakers
    - Paper and pens/pencils for notes
    - Markers or crayons

Before the Session

- **Read this training guide** to familiarize yourself with the content and to personalize the activities to best suit your style. Watch all videos and read informational materials. If you are planning on conducting the meeting virtually, please see our Preparing for Virtual Training guide.
    - *Italics indicate text that can be read aloud or emailed to participants.*
- Send a reminder email about the meeting. Determine if any participants require accommodations (sight; hearing; etc.).
    - *The next professional development opportunity to enhance our STEM skills will be on DATE at TIME. Our focus for this session will be "Creating My Project".*

      Please have paper and pencil for taking notes, markers or crayons, and blank paper or posterboard for making your own poster when you join the meeting. You may choose to print this handout before the meeting.
        - *Sample Poster: Computational Thinking Concept*

      This is a virtual training. You will connect to the training at INCLUDE LINK and will need to install VIDEOCONFERENCE APP on your computer before the session. Please test and familiarize yourself with the tool before the meeting. If possible, use a computer with video camera and headphones to participate in the workshop. This will give you the best experience.

      Let me know if you require any accommodations to fully participate in the training. I am happy to answer any questions you have and look forward to seeing you at the workshop. I can be reached at CONTACT INFO.

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- Gather all materials and handouts before the session to use as visual aids if necessary.
- Test your audio and video equipment.

Training Outline
Welcome and Introductions (10 min)

- Greet participants as they join the meeting. Encourage them to make sure the name on the screen is what they want to be called, to turn on their video and select gallery view so they can see everyone.
- Introduce yourself and the topic for this training, "Creating my Project".
  - *Today, we may be using Zoom (or another platform you've selected) in ways you may not have experienced before. We are going to [what you say will depend on the size of your session, options listed below]*
- **If you have less than 12 participants**, use the names on the screen to ask each person to introduce themself and share why they are interested in computer science. Using names will assist people in knowing when it is their turn to speak.
- **If you have 12 or more participants**, use breakout rooms to divide into groups of 4-5. Tell them they will have 7 minutes to get to introduce themselves and share why they are interested in computer science.
  - After 5 minutes, use the "Broadcast a message to all" button and tell the participants they have 2 minutes left to finish introductions.
  - After 6 minutes, click the "Close All Rooms" button. This will give each breakout room a 60-second countdown and will automatically end the breakout session and return them to the main room when the timer ends.
- Direct participants to https://support.zoom.us/hc/en-us/articles/115005769646-Participating-in-Breakout-Rooms if they need help with the breakout rooms.

Poster activity (20 min)

  - *Today we're going to start by having each person make a poster expressing one computational thinking concept for fourth graders. Do you have all the supplies you need – a piece of paper or poster board, a pencil, markers or crayons? If not, take a moment to gather them.*
- Share the [Sample Poster: Computational Thinking Concept.](#)
  - *Here a sample poster. It shows the computational thinking practices you can put in your poster – but we want your poster to help fourth graders understand one of*

these concepts. Do you have an idea to start with? You can do a Google search to inspire yourself if you want to.

- *Decomposition (breaking down a big problem into smaller pieces)*
- *Abstraction (process of using specific instances to generalize)*
- *Pattern recognition*
- *Creating an algorithm*

- Give participants 5-7 minutes to create their posters. Encourage everyone to keep their cameras on as they work and to use markers or crayons because the poster will be for fourth graders. If needed, answer questions as they are working. At the end of the time bring the group back together.
  - *Now I'm going send you to breakout rooms to share your posters with each other. Explain the concept you were expressing in your poster. Give each other feedback on your posters. As others are their posters think about whether you would prefer to use your poster or use my sample poster if you were explaining computational thinking to fourth graders. I will give you 5 minutes to share and then we will come back together as a group.*
- Divide into breakout rooms of two or three to share posters.
- After 4 minutes, click the "Close All Rooms" button. In 60 seconds, everyone will be automatically returned to the main room.
- When everyone is back in the main room, hold up the sample poster once again.
- Ask the following questions (5-7 minutes)
  - *If you were teaching about computational thinking, would you rather use your poster or the sample one? Why?*
  - *Why do you prefer the poster you selected? If they choose your poster, encourage them to modify, add color or add elements to make it better.*
  - *After seeing another poster, are their changes you would make to your poster to improve it? Would you want to create more posters?*

  - *What you have just done is a very fast use-modify-create progression. This progression has been shown to support and deepen students' computational thinking experience. Students first interact with an existing computational artifact. In our case, it was the sample poster I shared with you. Then they begin to develop their computational thinking skills by modifying an existing artifact. As they modify and change an existing artifact, it becomes their own, and they have the skills to create their own computational artifacts. You used your skills to create an initial poster, and*

you also considered how you could modify or improve your project after interacting with someone else's artifact.

o *By the end, did you prefer the poster you created over my sample poster? When young people are given the opportunity to use, modify and create computational artifacts, we find that they do in fact gain skills and confidence. To build their computational thinking skills, learners should be encouraged to develop their skills through this progression before they design their own projects and become creators – and furthermore, if they don't have opportunities to become creators, they will not develop their skills as fully.*

o *You can learn more about Use-Modify-Create progression at K-12 Computer Science at* https://k12cs.org/computational-thinking/

Rubber Duck Idea (10 min)

- Begin with a brief discussion about how participants solve a problem. The purpose is to allow them to think about how they work through a problem and what process they use.
  - o *When you have a problem that you are having a hard time figuring out, what do you do?*
  - o *What process to you use to solve your problem?*
- Cue up the Rubber Duck Story video.
  - o *Now we are going to watch a video about a unique problem-solving approach. As you watch the video, think about how the speaker's idea of problem-solving is similar or different to how you approach problems.*
- Play the video.
- Discuss:
  - o *Do you think the Rubber Duck strategy of problem-solving would be effective?*
  - o *Why do you think it works or does not work?*
  - o *Is it better for certain types of problems?*
  - o *How would you teach a youth in middle school to use the Rubber Duck strategy of problem-solving?*

  - o *Next, we're going to think about how young people grow and develop and relate that to teaching problem-solving strategies like using a rubber duck.*

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See the Skill in Action (10 min)

- o *Positive youth development is an intentional, pro-social approach that emphasizes how having positive relationships with adults and engaging with their communities, schools, and organizations helps young people be successful in life. These factors promote positive outcomes by providing opportunities, fostering positive relationships, and furnishing the support needed to build on their strengths.*
  - o *Now, we are going to take this concept of positive youth development and see how it can enhance computer science activities. Any questions about positive youth development before we move forward?*
- Cue up the [Where Are You Stuck? video-based learning module](#).
  - o *These videos focus on empowering young people or giving youth control of their learning. The first video will explain the activity called "Pitch your passion". The second video will focus on the giving youth control. As you watch the videos, think about how this activity might be challenging for someone not comfortable working with computer programming.*
- Show the video.
- Discuss:
  - o What did you notice in the video?
  - o How did the facilitator use positive youth development strategies to build computational thinking skills and give youth control?
  - o *What ideas do you have for activities or ways of giving youth control into existing curriculum you are using?*

Conclusion (10 min)

- o *Let me summarize what we covered today. Positive youth development promotes positive outcomes by providing opportunities, fostering positive relationships, and furnishing the support young people need to build on their strengths. One aspect of this is giving youth control of their learning.*
  - o *Think back to the posters you made. Were you proud of your poster? Was it better than the one I shared?*
  - o *Just because we create something doesn't mean we are proud of it, but when you come up with a unique solution to a problem, that is something to be proud of. Having someone else tell you how to solve the problem may be faster, but it doesn't give you sense of pride or competence. The same is true for young people. You'll find*

most of them don't enjoy struggling with a frustrating problem. They will ask you to tell them the answer and then they are done. But, when they are able to solve the problem on their own, you will see a difference in their eyes. They will feel more competent, more pride in themselves, and they are more likely to remember what they've learned.

- o *But it doesn't help to say, "I already know how to do this. You need to figure it out on your own." You can image the response that would get. The Rubber Ducky Story gives us another way to address a problem. I'm not suggesting that you bring a bunch or rubber duckies with you – though if you do, I'd love to hear how that works. I mean you should be their rubber ducky. Listen like a rubber duck, but don't give an easy answer. Ask questions that will guide them in the right direction. Say, "something looks wrong in this section – can you figure out what it is?"*
- o *Let's take a moment to brainstorm some rubber ducky questions. What open-ended questions can help young coders find their own solutions?*
- Record the ideas the group brainstorms and share them in your follow-up email message.
  - o *Thank you for your good ideas. Remember giving youth control of their learning and helping them solve their own problems contributes to their positive development, helps them be more resilient and develops their problem-solving skills.*
- Answer any final questions participants may have.
- **Remember to save the chat** before you close the meeting.

After the Session

- Compile ideas from the chat box.
- Within three weeks of the training, send an email to participants that includes links to the activities used in the workshop and any ideas from the chat boxes or whiteboards that might help them in their work with youth.
  - o *Thank you for your participation in the recent Click2Science training "Creating my Project". I hope you found it useful. Consider meeting with a co-worker, supervisor, or friend to share what you learned. Here are the rubber ducky questions we brainstormed.*

    (Add ideas brainstormed by the group)

    You can learn more about Use-Modify-Create progression at K-12 Computer Science at https://k12cs.org/computational-thinking/.

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I look forward to continuing our learning at the next session on SKILL/FOCUS on DATE at TIME at LOCATION. Please let me know if you have any questions. I can be reached at CONTACT INFORMATION.

Want to Earn Credit? Click2Science has teamed up with Better Kid Care to provide continuing education units. Check it out at: http://www.click2sciencepd.org/web-lessons/about

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Computational Thinking Practices

Decomposition

Pattern Recognition

Abstraction

Algorithm

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