Lesson 1: Problem Solving - Personal Innovations Facilitator Guide

Overview

This lesson is about getting students excited and connecting their own personal interests to computer science. Students are asked to share something they know a lot about and teach it to a small group. Groups make a “rapid” prototype of an innovative idea and share it. Students then watch a brief video about computing innovations. They then reflect on the employability skills they have developed and their potential next steps.

Purpose

This activity plants the initial seed for students to think about the ways in which they might be able to solve some problems relevant to their lives with technological innovations.

Agenda

Getting Started (10 min)

- What could you teach somebody?
- Group introduction and sharing ideas

Main Activity (25 min-35 depending on lesson length)

- Identify impacts and prototype an innovation
- Brainstorm Technological Innovation
- Rapid Prototype one idea
- Share Prototypes

Wrap-up (15mins)

- Show Video - “Computer Science is Changing Everything”
- Careers reflection and next steps

Objectives

Students will be able to**:**

- Communicate with classmates about computing innovations in their lives.
- Describe positive and negative effects of computing innovations.
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Preparation/materials needed

- ❑ Post-its, or paper and tape, or scraps of paper
- ❑ Poster paper for sharing innovations
- ❑ Print ‘Activity Guide’ handout (one A4 per student) (Alternatively you may want 1 A3 per group of 4, to ensure they all work together as a team)
- ❑ Download the session PowerPoint
- ❑ Queue up ‘CS is Changing Everything’ video

Links

- **Computer Science is Changing Everything** – Video: https://www.youtube.com/watch?v=1x54GqfL3UY&feature=youtu.be

Vocabulary

- **Innovation** - A new or improved idea, device, product, etc, or the development thereof

- **Prototype** - A first or early model of a product that allows you to test assumptions before developing a final version.

Teaching guide

This guide includes a suggested script for the session (in orange). However, please feel free to tailor and adapt this accordingly when delivering.

Section 1: Getting started (approx. 10 min)

What could you teach somebody?

"What's something that you know a lot about? Something that you could teach somebody?"

- This doesn't have to be a subject in school - it very well might not be.
- As a person, as an individual who is living and breathing in this world, there is something that you probably know a lot about maybe you feel like you know more about than most people. What is that thing?

Give students 1 minute to write it down on a post-it and stick it on the wall

- Note: putting name on the post-it is optional -- if you don't have post-its, use note cards and tape, or scraps of paper. Anything that allows for these topics/areas of interest to be seen in one place.

Survey the post-its on the wall to see the diversity of responses, maybe invite students to do this:

What you're trying to do here is get students to state something that they are interested in, but also know a lot about - something they might have insights into. A big part of students' enthusiasm for sharing will come from your enthusiasm and genuine interest in getting to know them. Students might need prodding: there is something that makes them interesting and unique. Something they like to do, have an interest in, read about, have some expertise in, a hidden talent.

Group introduction and share out
Take post-its and make groups of 4 that represent a diverse set of interests. For example, grab: "video games", "basketball", "cooking", "growing vegetables".

Once in groups, give each student 2 minutes to:

- introduce themselves
- explain the thing they know a lot about
- teach the group something about it, or tell the group something interesting about it

Section 2: Main Activity (approx. 25 min)

Students should remain in groups established during the getting started activity.

Identify impacts and prototype an innovation

Remarks

People seem to say that technology is all around us, that it affects everything we do. Is that true? Technological innovation is about recognising a problem that needs to be solved, or recognising something needs improving and then building a tool to solve it.

As a class we're going to see how innovative we can be. We're going to do something called "rapid prototyping."

"Prototype" is a fancy word that means a preliminary sketch of an idea or model for something new. It's the original drawing from which something real might be built or created.

Brainstorm technological innovation

Go around the group, and for everyone's area of interest:

1. Identify some way that technology is used with, or affects that thing
2. Suggest either:
   - a way that technology might be improved to make it better, faster, easier to use
   - a creative or innovative new technology might help solve a problem within that area, or at least make better?

Everyone in the group should make suggestions for any of the areas of interest at your table.

Rapid prototype one idea

As a group you have just brainstormed about the technology ideas at the table. Now, come together and get excited about one of them. As a group, nominate the idea you've discussed that you think would be the most interesting to everyone else in the class.

Start to sketch out that idea on a poster. Make a visual representation of your ideas. Remember:

- ➢ this is a rapid prototype. Just something to quickly convey the idea.
- ➢ give students a decent amount of time to work and sketch together.

Keep things quick. If a group is worried about not being innovative enough, remind them that very small ideas can have big consequences. People once thought it was ridiculous that you would want to send a short text message to another person over a phone. Alternatively, a group may have a great idea that they want to spend more time on. They can do that later. For now, just remind them it's a rapid prototype.

Share Prototypes

Do a "Gallery Walk" or a whip around so that each student can see all of the other students' work.

➢ Put prototype posters on the wall

➢ Give students time to survey the various posters

➢ Time permitting, ask an individual from each group to explain what the thing is or what their innovation is.

➢ If time is short, ask for one or two volunteers, or hand pick a poster or two for a student to explain.

Section 3: Wrap-Up (approx. 15 min)

Show Video and reflect on what they have learnt about computer science and how it is changing everything: "Computer Science is Changing Everything": https://www.youtube.com/watch?v=1x54GqfL3UY&amp:feature=youtu.be

Employability skills reflection:

What employability skills have you developed in this session? What might your next steps be in learning more and thinking about your career?

The slide outlines multiple employability skills as a prompt for pupils to reflect. Encourage them to pick three and think of three specific examples to support how they have displayed these skills in the session. This is good practice for job applications and interviews - particularly competency based application processes.

Want to find out more

If you have time you could click on the links provided, or just point the pupils towards these. It should be made clear that the opportunities outlined are just those at PwC, and pupils should be encouraged to look at other opportunities too.

Link for more info: PwC Podcast - spotify - A-Z of tech (https://www.pwc.co.uk/issues/intelligent-digital/a-to-z-of-tech-podcast-series.html)

Link for opportunities in tech:

- Technology Degree Apprenticeships and Data Science Graduate Apprenticeships.

  (https://www.pwc.co.uk/careers/early-careers/our-programmes/flying-start-degrees/technology.html)

- School and College Leaver Apprenticeships at PwC (https://www.pwc.co.uk/careers/early-careers/our-programmes/join-us-from-school.html)