



DIGITAL LITTERACY

Computational Thinking Exploring Decomposition

These unplugged activity ideas are meant to show examples of each key concept of computational thinking, in order to demonstrate its importance. You may find overlaps in the concepts presented in the activities; this is to be expected, since they are a part of a whole process that happens simultaneously.

Everyday life scenarios

1. Ask your participants to plan an event, such as a birthday party, a basketball game, or a fundraising campaign.
 - Ask them to brainstorm and write down all the steps required to make their event happen, such as booking the basketball court and recruiting players.
 - Can the steps be subdivided into even smaller steps? For instance, recruit players could be divided into planning two teams, then divided again into other related tasks such as: assigning players to teams, deciding on the team names, choosing a logo.

Discussion

- How important was it to choose the right words in your decomposition?
 - Did other teams have different steps from you?
 - Could you subdivide a few of your steps?
2. Have your participants create an origami paper model.
 - Origami is a type of decomposition, as it follows specific steps in order to be completed. Show your students a picture of a completed origami model and ask them to reproduce it. After a few minutes, provide them with the step-by-step instructions to create the model and try again.

Discussion

- Were you able to reproduce the design without the instructions?
- What made this challenging?
- How did you approach the challenge?
- How did your strategy change once you received the instructions?
- Were there any steps that should have been broken down into more steps for clarity?



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20-30 minutes



Grade 5 and up



Solo or Team



Intermediary

Hidden Pictures: Decomposition in Computer Programming

There are many systems used to make computers interpret colours such as HEX, CMYK and RGB. The RGB colour model uses the addition of light wavelengths from the red, blue, and green ranges of the spectrum, which combine to create new colours. This is similar to how the three types of colour-sensitive cone cells in human eyes perceive colours. To recreate and display a colour, the computer uses decomposition to assign it its own unique code.

Lesson goal

The goal is for participants to delegate, establish tasks, and find appropriate approaches.

Preparation

- Print out or share of the document *Exploring Decomposition: Hidden Picture Activity*.
- Choose a model from worksheet #1, and print it for each team.
- Cut the grid into four rectangles, following the cutting lines.
- Have participants prepare colouring crayons which must include:
 - Blue, orange, red, black, purple, pink, yellow, and green
- If you are doing the activity with younger students, have them load a RGB Colour Code Chart from a [website](#), or use the “More colour” option of the filling tool of any editing software (such as Word or Google Doc).
 - If you are doing the activity with students who have a higher level of digital literacy, finding the appropriate RGB Colour Code Chart can be part of their task.

Task

Complete and assemble the drawing by filling in the colours in the square using the codes provided, and by putting the rectangles in the appropriate order to reveal the hidden picture.

Go further

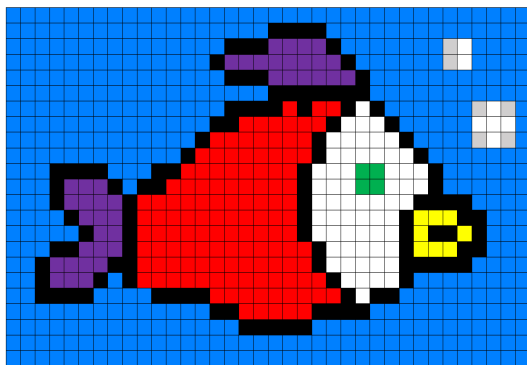
Ask participants to create a design using the colour key. Share the design between peers to be completed, and admire the results.

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Solutions

RBG code	Code in model	RBG code	Code in model	RBG code	Code in model
R: 255 B: 255 G: 255	1: White	R: 51 B: 255 G: 51	4: Green	R: 0 B: 128 G: 255	7: Blue
R: 236 B: 31 G: 31	2: Red	R: 255 B: 128 G: 0	5: Orange	R: 128 B: 0 G: 128	8: Purple
R: 250 B: 255 G: 102	3: Yellow	R: 0 B: 0 G: 0	6: Black	R: 192 B: 192 G: 192	9: Grey

Model A



Model B

