



Decomposing Images

UConn 4-H Summer S.T.E.M.

Background

Have you ever been given a task to complete and you're not sure where to start? The first step is usually to take the task and break it down into more manageable steps. This process is called **decomposition**. In this lesson we will explore decomposition by breaking down simple everyday tasks into smaller steps and building designs using Tangram blocks.

Supplies and Tools

Tangram geometric shape blocks

Index card or paper

Pencil

Tangram worksheet



Activity Steps

Notes

Activity 1: Choose an everyday task such as brushing your teeth, making your bed, etc. Decompose the process into individual steps. Write down each of these steps in the order they need to happen.

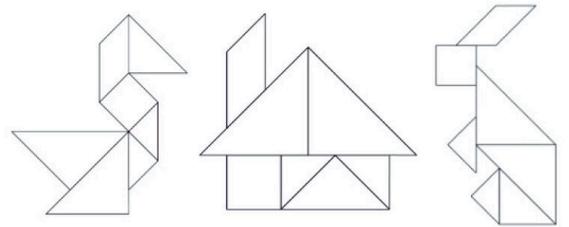


1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

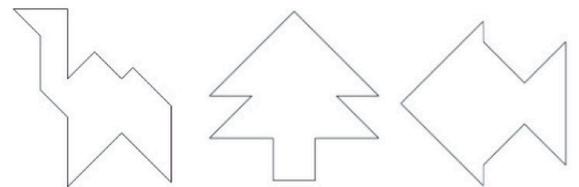
Activity 2: In this activity, we will use **tangrams** to practice identifying pieces of a problem. Tangrams are squares cut into 7 shapes that can be arranged to make another shape or image. Take the shapes out of the package and create new geometric shapes.



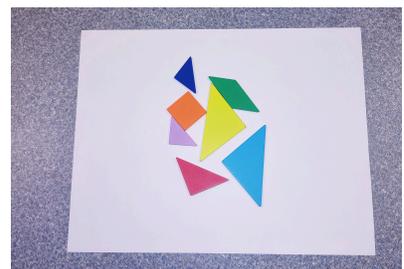
Activity 3: Take your tangram blocks and create the shapes outlined in the picture. Decompose the image into its shape and color patterns to find the correct combination to achieve your goal.



Activity 4: If you were successful in the last activity, see if you can solve these more challenging puzzles by placing the correct blocks to recreate these shapes.



Activity 5: Create your own tangram picture. You want to use all 7 shapes in your design. Once you have made your design, trace it's outline on paper and challenge a friend to complete using their blocks.



Bonus Activity: Look around your house or in nature to explore additional tasks that can be decomposed into smaller steps. Imagine you needed to create a program so that a robot could complete the task. How many steps would you need for the robot to complete the task successfully?

Career Connection: Jori is a project manager working for a digital agency in Chicago. She uses decomposition as part of her job to divide out project steps and assign tasks. She manages projects including mini games, websites and YouTube ads. When breaking down a project into smaller pieces, she knows how important it is to listen to the rest of her team to hear important details, making sure nothing gets left out. One of her favorite parts of being a project manager is communicating with team members. She loves being part of creating a project from start to finish, recognizing all the steps needed to make the project a success.

<https://4-h.org/clover/activities/cs06-decomposition/>

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You can also find more fun, hands-on learning activities at **Clover by 4-H**. To discover a wide selection of 4-H activities and online courses, visit 4-H.org/Clover.

This lesson was adapted from “Break It Down! Using Decomposition” by Utah State University and Google through the Clover by 4-H online learning platform.

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