PLTW | Launch

Activity 1.1 What Are Structure and Function? Teacher Notes

Introduction

Everything around us that is not from nature was designed and built by humans. Every object was created to serve a specific purpose.

When engineers and designers create new items, they must consider both structure and function.

An **engineer** is a person who asks questions, observes things, and gathers information in order to create new products or make old products better.

Structure refers to the way something is built, including shape, size, and the way the different parts work together.

Function is what something does or is intended to do; the function of a clock is to tell time.

Equipment

- Pencils or crayons for sketching
- Launch Log for each student
- Variety of classroom items to demonstrate structure and function
- iPad® tablet
- Tablet application
    - Autodesk® SketchBook® Express

Procedure

1. Introduce the idea that everything around us except for items found in nature has been designed by a person. During this discussion introduce the role of an engineer as a person who asks questions, observes things, and gathers information in order to create new products or make old products better.
2. Use examples from the classroom to identify structure and function of a variety of objects. These may include pencils, chairs, windows, computers, shoes, backpacks, and other common items.
3. The teacher may wish to lead students on a walk around the classroom to identify objects with a variety of structure and function or request that the students choose an object in the room to describe.
4. Provide students with the Structure and Function Launch Log. Direct students to Activity 1.1 What Are Structure and Function. Alternatively, students may

complete the sketches described in the next step using the SketchBook Express app on their tablets.

5. The students will draw an item that will fulfill the function described. After the students draw the item, they will share with a partner or small group the item they drew. With guidance and support, the students will identify common structures in their drawings.
    a. Drawing 1: Draw an item that has the function of holding water.
    b. Drawing 2: Draw an item that has the function of cleaning a kitchen.
    c. Drawing 3: Draw an item that has the function of writing a letter.
    d. Drawing 4: Draw an item that has the function of moving people.
6. The items listed above are meant to prompt students to draw a variety of different objects and then look for similarities in structure. For example, the first drawing may result in students drawing a water bottle, cup, or bathtub. All these have the same general function and have similarities in structure, such as a hollow space to keep the water from leaking out.
7. Review with the students the new vocabulary terms, including engineer, structure, and function.

Conclusion Questions for Discussion

Note: The conclusion question may be for discussion only and can be documented as a whole class.

1. In the activity you drew items that had a function like holding water. What questions would an engineer need to ask to design this item?

    Student responses may include: How much water will it hold? Is the water for a person to drink? What is the water used for?