

Activity 2.1 Introduction to Forces

Introduction

To solve the animal rescue problem, you will need to know about forces, interactions, and simple machines. Examples of these are all around us. Did you realize that picking up your pencil or clapping your hands requires you to use force?

A force is a push or a pull that can make an object move, stop moving, or even cause it to change directions. How do you use forces? When you kick a soccer ball, you are using a force to push the ball across the field. Pulling a wagon is another example of forces at work. At times forces are invisible – consider the wind pushing leaves across the ground.

In this activity you will learn more about forces and interactions and how they are used to do work. You will also explore simple machines.

Equipment

- iPad® tablet
- Tablet application
 - Canvas by Instructure
- Launch Log
- VEX IQ® Construction Kit
- *How Do You Lift a Lion?*, by Robert E. Wells

Procedure

1. Follow your teacher's directions to open Activity 2.1 Introduction to Forces using the Canvas app on your tablet.
2. To prepare for this activity, label a new page in your Launch Log with "Forces" as the heading.
3. To learn more about forces and interactions, open the Introduction to Forces presentation. As you work through this presentation, follow the directions to complete the activities.
4. Read the book *How Do You Lift a Lion?*, by Robert E. Wells. As you read the book, think about how forces, interactions, and motion are being used to complete the tasks.
5. In the book *How Do You Lift a Lion?*, simple machines were used to lift or move animals. On your tablet select the Simple Machines presentation. Work through this presentation to learn more about simple machines.
6. Using VEX IQ® components, work with your group to build a model that uses a wheel and axle to move a load. You may create the load using VEX IQ® components, or you may use other materials provided by your teacher.

7. Use the Popplet Lite app to create a presentation of your design to share with your class. Include the following in your Popplet:
 - Take a picture of your wheel and axle design using the camera app on a tablet and add it to the Popplet.
 - Describe how this simple machine could make work seem easier.

Conclusion Questions

Record your answer to the questions below in your Launch Log. You may also choose to post your answers using the Canvas app on your tablet.

1. Choose one task that was described in the book *How Do You Lift a Lion?* What are your ideas for completing that task? How would you use forces and simple machines?
2. Describe an action or create a sketch that shows two forces you used as you got ready for school today. Answer these questions:
 - Were you using a push or a pull in each interaction?
 - What was the effort force?
 - What was the resistance force?
3. Name an item found on a playground that uses a simple machine to make it work. What kind of simple machine is used? How does the simple machine make work seem easier?