

INV. 2 ACTIVITY—MEDIA RESOURCES

Online Resources on FOSSweb (Must log in to FOSSweb with a username and password)

Use these online resources to help review content from Investigation 1 and Investigation 2 of Mixtures and Solutions. The **tutorials and virtual investigations** provide interactive resources that review concepts from the FOSS active investigations. The virtual investigations often mimic the active investigations that were done in class.

For the articles in *FOSS Science Resources*, access the **interactive eBook** and make sure to click on the interactive links within the readings. Take notes on what you learn from the online resources and respond to the questions from the articles in your science notebook.

Investigation 1 Digital Resources

Online activities:

- Separating Mixtures

Tutorials:

- Mixtures
- Solutions
- Conservation of Mass

Virtual Investigations:

- Separating Mixtures

FOSS eBook Readings

- Mixtures
- Making Mixtures Apart
- Science Practices
- Engineering Practices
- Extracts
- The Story of Salt

Review these resources at the end of Investigation 2

Investigation 2 Digital Resources

Online activities:

- Black Box (Reflecting Light)

Tutorial:

- Models

Streaming Video:

- Changes in Properties of Matter

FOSS eBook Readings

- Beachcombing Science
- Solid to Liquid
- Liquid and Gas Changes

INV. 2 ACTIVITY—DESIGN A SYSTEM TO FIGURE OUT

Focus Question: How can you design a black box at home?

In class we learned that a black box describes a system where we cannot see inside it to see how the system works. We explored black boxes and developed models to explain how the boxes behave the way they do. Create your own black box and have your family try to figure out how the box works.

Materials:

- Small cardboard box that can be completely sealed, no larger than a small shoe box
- Solid geometric shapes such as corks, small wood or foam blocks, or tiny cardboard boxes
- Glue or tape

Instructions:

1. Wine corks will work well but you can also use small wood blocks or tiny cardboard boxes.
2. Tape or glue the objects to the bottom of the cardboard box.
3. Add a marble to the box.
4. Seal the box completely with tape.
5. Have your family try to determine the shapes of the objects in the box. Just as we did in class, they need to follow these rules:
 - a. The box needs to stay sealed.
 - b. Rocking and tilting the box is allowed.
 - c. No pushing on the box to try to find out what it is like inside.
 - d. No writing on the box.
6. Have them draw a model of what they think the inside of the box looks like based on their observations.
7. Make other boxes that are more complicated and have your family determine how the box looks inside with the new shapes.

INV. 2 ACTIVITY—DESIGN A VENDING MACHINE

Focus Question: How can you design a unique vending machine?

Vending machines have become much more than a place to buy a quick drink, bag of chips, or some candy. Vending machines have become so more novel and unique. In some countries they are even a way of life.

Research the history of the vending machine and how they have evolved to provide different kinds of products.

Instructions:

1. Research the history of the vending machine. You can use the links suggested above or do your own Internet search.
2. Design your own unique vending machine. Your machine should adhere to these criteria.
 - a. What is the product your machine will provide?
 - b. Draw a model of how your machine works. Include how putting in your payment (cash or credit card) activates the machine to dispense your product. (Think back to the Drought Stopper designs you drew for inspiration.)
 - c. If your product needs special consideration, such as refrigeration or dispensing of liquids, be sure that is part of your design.
 - d. Include the capacity of your machine? (How much product can it hold and how is unsold product sold and kept fresh?)