

HEALTH & LIFE SCIENCES ACTIVITY BUNDLE

→ For Grades K-2

Four hands-on STEM activities that introduce K-2 learners to health science careers through investigation, movement, and nutrition.



STEM Next Health & Life Sciences Activity Bundle (K-2)

Welcome to the STEM Next Health Science Activity Bundle! This bundle is one of three bundles now available from the Health & Life Sciences Center of Excellence, powered by the Institute for a STEM Ready America.

Use the four activities below to inspire K-2 youth with hands-on science. Through these activities, youth will develop foundational STEM skills by engaging in hands-on investigations of health science concepts (medical imaging, physical therapy, and nutrition), while building career awareness by exploring how professionals use science, technology, engineering, and math.

Interested in more resources like this from STEM Next? Check out our [Tools in our online Resource Library](#).

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Lesson 1: X-Ray Exploration

In this lesson, youth will be able to:

- Understand how X-rays work on a basic level by seeing inside objects.
- Practice observation, prediction, and explanation skills.

Time needed: 60 minutes



Preparation

Materials	• <u>X-ray slide presentation</u> (or <u>X-ray cards</u>) • Brown paper lunch bags • Small everyday objects that youth would be familiar with (crayon, marker, block, water bottle, etc.) • Flashlight or light source
Setup	• Label paper bags with numbers. • Place one small object in each bag and seal with a staple or tape. • Print copy of X-ray cards for each group of youth. (optional)

Facilitation

Overview:

In this activity, youth will investigate X-ray technology through hands-on exploration. Youth explore how X-rays allow people to see inside objects without opening them, and how this technology is used in fields such as medicine and security.

Engage:

1. Ask youth: *How do doctors see inside your body without opening it? Who has ever had an X-ray? Could you describe what happened? Where did you go for the X-ray? Why did you need an X-ray?* Explain that X-rays help medical professionals see inside the body. They help identify injuries without a surgical procedure.
2. Show examples of X-rays (Slides 3–8). Ask the group if they can identify the animal in the X-ray. After several guesses, show the animal picture.
3. Show an X-ray of the human body (Slide 9). Ask youth to point to different body parts on the X-ray, such as a thigh, arm, finger, shoulder, ankle, toe, etc.

Investigate:

1. Explain to the group that we don't have an X-ray machine in the room, but we can pretend that we do. Show one of the lunch bags. Ask youth how they would go about determining what is inside the bag without opening it. Demonstrate the ideas youth share. Be sure to demonstrate shining a light through the bag, similar to an X-ray. Have youth make guesses as to what is in the bag. Once enough guesses have been given, open the bag and show the group what was inside.
2. Place the other bags around the room. Direct youth to move from bag to bag to identify the object. Allow youth about 10 minutes per bag to explore and make their guesses.
3. Bring the group back together and ask what youth did at each station to determine what was in the bag. Stress using observations. Consider writing the observations for each bag on the whiteboard or poster paper. Have youth make a guess as to the object in each bag. Write the guesses on the board. After each bag has been discussed, open the bag to reveal the object.

Wrap-up:

Discuss some or all of the following questions: *How is the bag similar to the human body? In our activity, what acted like an X-ray? Were all the objects easy to guess? Did the light pass through all the objects? Do you know any other uses for X-rays?*

Implementation

Alternative facilitation:

- Make copies of the X-ray cards. During the Engage activity, allow youth to work in pairs to identify the animals.
- If you have a small group, move youth from table to table all together to determine what is inside each bag. This method will allow you to discuss and reveal the object at the same time.

Career Connection:

- Radiology technologist: Provide youth with a different body part that has a broken bone. Using black construction paper and chalk to simulate an X-ray, have youth draw a picture of the broken bone as the X-ray might show.
- Airport security: Using black paper and chalk, instruct youth to draw a picture of what airport security might see inside their backpack as it goes through the security X-ray machine. Have other youth in the group guess the contents of the backpack based on the drawing.

Lesson 2: Power Play

In this lesson, youth will be able to:

- Perform numerous physical activities that build balance, strength, and flexibility.
- Follow and provide clear instructions to complete a task.

Time needed: 60 minutes



Preparation

Materials	• Station cards • Beanbags or small stuffed animals • Small box filled with objects for youth to carry • Laundry basket or small plastic container • Painters tape or masking tape (to stick to floor) • Floor spots or small cones • Tongs or tweezers • Paper plates • Pasta or similar small objects • Small bowls
Setup	• Copy the station cards and place them at different stations around the room. Place needed materials at the appropriate station. ○ Place a line of tape across the room on the floor at Station 1. ○ Place a basket and stuffed animals or similar objects at Station 2. ○ Set up small obstacles (blocks, rugs, boxes) for youth to step over at Station 4. ○ Use tape to mark off a designated “skating” area and place multiple paper plates at Station 5. ○ At Station 6, place pasta, cotton balls, or other small objects in a bowl. Place tweezers, kitchen tongs, or something similar next to the bowl. Place a paper plate or another small bowl to collect the objects.
Presentation	Slides

Facilitation

Overview:

In this activity, youth will perform various movements that will build balance, strength and flexibility. Youth will take on the role of a physical therapist to provide support and instructions to others.

Engage:

1. Ask the group if they have ever played Simon Says. Have one youth explain the rules. Play a few rounds of Simon Says, engaging the group in movement activities such as the following:
 - Hop on one foot 10 times.
 - Jump as high as you can 5 times.
 - Take 5 of the biggest steps that you can.
 - Stand on your right foot for 5 seconds.
 - Flap your arms like wings.
 - Do 5 jumping jacks.
 - Spin in a circle.
 - Touch your toes 10 times.
 - Do 5 squats.
 - Shake your whole body.
2. To engage youth even more, invite one or two youth to be Simon.

Investigate:

1. Remind youth about the X-ray activity. Add that sometimes an X-ray shows when a bone is broken. Once the bone heals, the person may need to regain some strength by visiting a physical therapist. Physical therapists are helpers who teach people how to move their bodies safely and get stronger.
2. Tell youth: Today, you are going to be a physical therapist and help a friend get stronger, gain balance, and become more flexible after an injury. You will work with a partner. One of you will be the patient and the other the physical therapist. Then you will switch roles.
3. Take youth from station to station to demonstrate each activity.

4. Divide the group into pairs and place each pair at one of the stations. Select one youth in each pair to be the physical therapist. The physical therapist will provide the directions for the first three stations while the other partner will be the patient and will follow the directions.
5. Allow 3 to 5 minutes at each station. Announce to the group when it is time to switch stations. After three station changes, have youth change roles, so the physical therapist becomes the patient.

Station Breakdown

Station 1: Balance Builder

The patient walks heel to toe on the tape line across the floor.

Station 2: Stretch and Reach

The patient lies down on their back. The physical therapist places a basket at their feet. The patient raises their legs to near vertical and places a beanbag or small stuffed animal between their feet. The patient then lowers their legs slowly to drop the object into the basket. The goal is to complete the task three times successfully.

Station 3: Strength Squad

The patient does five wall push-ups and five squats.

Station 4: Move and Carry

The patient steps over the obstacles while carrying an object like a small box across the room.

Station 5: Balance

The physical therapist places two paper plates on the floor and asks the patient to stand on the plates, one foot on each. The patient slides around the marked area.

Station 6: Fine Motor

Using tweezers, kitchen tongs, or something similar the patient picks up objects from the bowl and transfers them to the plate.

Wrap-up:

Bring the group back together and discuss their experience. Ask: *Which role was harder, being the physical therapist or being the patient? What kind of motion did you do at Station 1? Station 2? Station 3? Station 4? Station 5? Station 6? As the physical therapist, what words did you need to use to encourage your friend?*

Implementation

Career Connection:

- Physical therapist assistant: Invite a physical therapist assistant from a local hospital or physical rehabilitation center to hold an activity session with the group.
- [Bioengineer and biomechanist](#): Learn about Kirsten Tulchin-Francis, a bioengineer and biomechanist whose interest in sports and science combine to help her help people move better.
- [Astronaut fitness trainer](#): Learn how Corey Twine assists astronauts to maintain good health and fitness while living and working in space.

Lesson 3: Nutrition: Fat Detection Test

In this lesson, youth will be able to:

- Classify foods into food groups.
- Determine whether a food contains fat.
- Use the scientific method to make a hypothesis, complete an experiment, collect data, and draw conclusions.



Time needed: 60 minutes

Preparation

Materials	• Food group labels • Food cards • Brown paper lunch bag • Various food samples, such as butter, potato chips, apple slice, nuts, cheese • A lamp or window • Music source
Setup	• Cut the lunch bag into large squares. • Label each square with the food that will be tested, one food per square. • Cut foods into similar size samples.
Presentation	Slides

Facilitation

Overview:

In this hands-on investigation, youth explore the presence of fats in everyday foods using a simple and visual method known as the “grease spot test.” By applying small samples of different foods to paper and observing how light passes through the dried spots, youth learn how fats leave behind a translucent residue.

Engage:

1. List the five food groups on the board: fruits, vegetables, grains, protein, dairy. Invite youth to give examples of foods and their food group.
2. Play the Five Corners Game. The object of the game is to be able to identify foods into their correct food group. Place the food group labels around the room. Draw a food card and show it to the group. Play some music. When the music begins, have youth move to the food group to which they think the food belongs. When the music stops, all youth should be in front of a food group. Play several rounds to familiarize youth with the food groups. For the last round, show a picture of a potato chip. This food will be difficult for youth to categorize. Call it a “sometimes” food. Explain: A “sometimes” food is a food with added sugars or fats. These foods are tasty, but they fill you up so that you don’t have room for healthy foods. Fats provide energy. You also need fat in your diet to supply essential fatty acids for growth. You can enjoy these foods once in a while but not every day.

Investigate:

1. Tell the group that now they will test different foods to tell if they are fatty or not.
2. Divide the group into pairs. Give each pair a paper bag square and a food sample. Ask each pair to show the food to the whole group and share whether or not they think it is a fat. Consider making a chart on the board to keep track of the foods, predictions, and experiment data.

FOOD	HYPOTHESIS	OBSERVATION	FAT or NOT
Banana			
Cheese			

3. After pairs share their predictions, have them roughly rub a small amount of their food onto their paper bag square. For liquids or soft foods, instruct youth to put a small smear in the center of their paper bag square. Tell youth to rub while counting to 15.
4. Have youth dispose of their food in the trash.

5. Ask pairs to observe the results by holding the papers up to a light source. If the spot on the paper bag remains translucent (greasy) and lets light through, the food contains fat. A water spot will disappear when dry.
6. Have each pair share their results with the larger group and classify their food as a fat or not. Record this information on the chart.

Wrap-up:

Bring the group back together and ask: *Did any results surprise you? What are some foods that we tested that you should only eat sometimes?*

Implementation

Alternative facilitation:

Have each pair test all the foods and then compare results as a larger group.

Career Connection:

- Dietician: Have youth use the [MyPlate template](#) to create a healthy meal. Youth can draw or write the names of the foods they will include in their meal.
- Dietician: As a group, make a healthy snack. Some ideas include:
 - a. [No Bake Trail Mix Granola Bars](#)
 - b. [Frozen Yogurt Bark](#)
 - c. Fruit and cheese kabobs
- Dietician: Invite a dietician from a local hospital or university to speak to the group.
- [Space food scientist](#): NASA space food scientist Xulei Wu discusses what considerations go into preparing food for the astronauts on the International Space Station. Learn how Wu trains astronauts for dining in space and how she has met the challenges of eating in a microgravity environment.

Lesson 4: Name That Health Center

In this lesson, youth will be able to:

- Name careers in the healthcare sector.
- Recognize tools that different healthcare careers use.
- Explain responsibilities or duties of several healthcare careers.



Time needed: 20 minutes

Preparation

Materials

- Large box or bag
- Printed X-ray
- Printed medical chart
- Stopwatch
- Beanbag
- Tweezers, chopsticks, or tongs
- Plastic food
- Food bags
- MyPlate template
- Measuring tape
- Elastic bandage (optional)
- Health tracker (optional)
- Flashlight (optional)

Note: Any of these materials can be replaced with materials used in the previous three activities or other tools related to the healthcare careers discussed in the activities. If you utilized the Career Connection alternative careers, include tools that could be used in those careers as well. Ideally use 8 to 10 tools.

Setup

- Gather all materials and place them in a large box or bag.

Facilitation

Overview:

In this review activity, youth identify various workplace items from a mystery box and explain how the item is used in various healthcare fields. By exploring these tools, youth review the activities they completed related to specific careers.

Engage:

Gather youth in a circle around the box or bag. Show the group a tool that a teacher uses, such as a stapler, bell, or whiteboard. Ask the group what job would use this tool. Explain that different tools are associated with different jobs.

Investigate:

1. Tell the group that there are several items in the bag that represent some of the healthcare careers they explored in the activities. Let youth know that as you pull out a tool, they should think about what career uses that tool and how it is used.
2. Display one tool at a time. As you take the tool out of the box, ask youth to identify it. Ask youth what career might use the tool in their work and to explain how the tool could be used. Encourage youth to ask questions about the occupations. Remind youth of the activity they completed related to that career to initiate conversation. As time allows, have youth brainstorm other tools people use in their work.

Wrap-up:

After all the tools have been discussed, ask the group if anyone would be interested in one of these careers. Ask if anyone knows anyone who works in a health field. Discuss other healthcare careers, such as nurse, speech therapist, pharmacist, etc.