Activity

Are We Always the Same Height? Unit: Strength and Flexibility

Overview

Our bodies are made up of materials that have strength and flexibility. We will explore how our bodies change (flex).

We will also compare what happens to astronauts' bodies on the International Space Station to our bodies here on Earth.

Story Time/Science Time from Space Connection

ISS Experiment Video

Astronaut Height on the ISS with Astronauts Peggy Whitson and Shane Kimbrough www.storytimefromspace.com/human-effects

Content Area





Activity Objective

Students will accurately conduct an experiment.

Students will gather and compare data.

Students will understand that our bodies are made of materials that have strength and

flexibility.

Instructions

- a. Explain to students that they will be conducting an experiment at home, and then bringing the results back to school.
- b. Discuss with students the fact that our bodies are made up of materials that have both strength and flexibility. For instance, our bones provide us with strength, and our muscles provide us with flexibility.
- c. Review with your students the instructions on how to conduct the experiment at home. The instructions are on the Student Worksheets provided.
- d. Send instructions, graph paper, parent letter and Science Notebooks home with students.

Back in the classroom after results are returned from students:

- e. Have students graph height vs time, in their Science Notebook.
- f. Discuss with your students what the results show. Results should show that students are taller first thing in the morning and then squish back down (compress) to a consistent level after 60 min.
- g. Discuss with and question students as to why this has happened! (When you are standing, your spine is being compressed. When you are laying down, it is not compressed as much.)
- h. Have students answer the following questions in their Science Notebooks:
 - 1 What is your true height?
 - 2. Do you think your height varies throughout the day?
 - 3. Does your height vary with the type of activity you do?
 - 4. What is your average height?
 - 5. What is your range of heights?
- i. Show the video called *Astronaut Height on the ISS*.
- j. Discuss what happens to Shane's height while he is in free fall on the ISS. Is it the same as what happened to your students or different? (the same)
- k. How does Shane's height in free fall compare to his height on Earth?
- I. Why is Shane's height different on the ISS compared to on the ground? (The ground is not pushing up on him and squishing (compressing) his spine!)

Book

Wall

Graph Paper

At home At school 10 10 10 10 10 10 10 10 10 10 Materials Tape **Graph Paper** Pencil Book or square Tape measure

Notes for Next Time

Use this section to provide yourself with notes on what you liked and what you would like to change.



Dear Parents and Caregivers:

We're learning about strength and flexibility in science class. Can you please help us with our experiment by completing the following activity with your child:

- 1. Have your child show you the instructions for this experiment. The instructions are located in their Science Notebook.
- 2. Please complete this experiment by _____

(Date)

3. Send the completed *Student Worksheet Page for Home* back to school with your child.

Thank you for helping your child learn about strength and flexibility,

and encouraging exploration of science!



My Science Notebook

Name

Observation

Discover

Test

Calculate



Explore



Name:_

Strength and Flexibility

Activity - Are We Always the Same Height?

Instructions:

- a. Tape a sheet of graph paper on the wall at your head height.
- b. Highlight a vertical line on the middle of the paper.
- c. Find a book and set it near your experiment.
- d. Find a helper who will help you in the morning.
- e. Have a book (or square) handy along with a pencil.
- f. In the morning, after a good sleep, before getting out of bed, call for your helper. Have the helper get the book (or square) and a pencil ready.
- g. Immediately, without jumping, carefully get out of bed and stand with your back to the wall as seen in the diagram. Have your helper line the book up with the spine of the book along the vertical line and the bottom of the book on the top of your head.
- h. Have your helper mark your height and label with the time.
- Resume again and take another measurement in 2 minutes, 4 minutes, 6 minutes, 10 minutes, 20 minutes, 30 minutes and 60 minutes. Between measurements, remain standing or walking. Do not sit or lay back down!



j. In between your measurements being taken, measure the height, in inches, up to the line your helper drew and document your height into your Science Notebook.

Things to watch for:

- 1. Keep your posture the same for each measurement.
- 2. Place the book the same way against the top of your head and against the wall each time.



Name:_____

Activity - Are We Always the Same Height

Answer the following questions:

What was your height:

Immediately after getting out of bed? _____inches

After 2 minutes? _____inches

After 4 minutes? _____inches

After 6 minutes? _____inches

After 10 minutes? _____inches

After 20 minutes?_____inches

After 30 minutes? _____inches



Student Worksheet for the Classroom

Name:_____

Graph height vs time below:

What is your true height? ______inches

Do you think your height varies throughout the day?

Does your height vary with the type of activity you do?

What is your average height? ______ inches

What is your range of heights? ______ inches to ______ inches

What happens to the Shane's height while in free fall on the ISS?

Is it the same as what happened to you, or different? ______

How does Shane's height in free fall compare to his height on Earth?

Why is Shane's height different on the ISS compared to on the ground?

