ACTIVITY KIT

TYPES OF FORCES

GRAVITY – a force that pulls an object toward it; any object with mass has a gravitational pull. **Key example: the earth's pull on us and the moon.**

BUOYANCY – an upward pushing force that exists in fluids (liquids and gases). **Key example: objects floating in a pool.**

FRICTION – a force resisting motion. It exists on surfaces like ice (low friction) and concrete (high friction). **Key example: gliding on ice.**

MAGNETISM – an attractive or repulsive force that exists in certain rocks and metals, or can be created by wrapping a metal with wire and running an electric current through it (an electromagnet). **Key example: using a magnet to put up your report card on a fridge.**

TENSION – a force pulling a string, rope, chain, or beam in different directions. **Key example: the strings of a guitar.**

NUCLEAR - the force holding the nucleus (the center) of an atom together. **Key example: nuclear fusion powers the sun and nuclear fission can be used to create electricity.**

SPRING – the force trying to get a spring back to its resting position. **Key example: a trampoline.**

ACTIVITIES

ROLLING RACE

(showcases gravity and friction)

Set up a ramp using books or a plank. Cover each ramp with a different material. Get creative! You can use tinfoil, parchment paper, fabric, carpet, towels, sandpaper, rubber grip mats, etc. Release different objects (balls, toy cars, marbles) from the top of the ramp and see which reaches the bottom first. What's pulling the cars down? What's slowing them down? Discuss the effects of gravity and friction.

TWO ORANGES

(showcases buoyancy)

Get a jug of water and two oranges. Peel one orange and leave the other one unpeeled. Which will float and which will sink? Discuss why buoyancy makes one of the oranges float. Hint: air pockets.

TREASURE-HUNTING SENSORY BOTTLE

(showcases buoyancy and magnetism)

Fill a large pop bottle with water. Place coins and other pirate treasure into the bottle. Use a magnet on the outside of the bottle to find the coins. Discuss how magnetism helped the treasure hunt. Discuss why buoyancy kept some objects floating, while others sank.

TUG OF WAR

(tension)

Get a large rope and have two different groups pull on each end. What happens when both sides are pulling? What happens when one side lets go? Discuss how the act of pulling causes tension in the rope.

ACTIVITIES CONTINUED

SWINGING PATTERN

(magnetism, tension, applied)

Use a string to hang a donut magnet from a ring stand so that it is a free-moving pendulum. Arrange 4-6 other magnets around the base of the stand in a triangle. Using masking tape, tape them in place. Adjust the string length to make sure the hanging magnet comes as close to the other magnets without touching them. Give the pendulum a push. How does the swinging magnet move? Change the orientation of the magnets on the table so some attract, and some repel. How does this affect the pattern? Discuss how pushing the magnet (applied force) and the position of the magnets creates new patterns in the pendulum swing.

SPRING SCALES

(gravity and spring)

Use a spring scale to weigh different objects. How does the spring react with a heavier object? What makes an object heavier?

PERSONALITY QUIZ

WHAT FORCE ARE YOU?

GRAVITY, BUOYANCY, FRICTION, MAGNETISM, TENSION, NUCLEAR, OR SPRING?

1. Which activity do you find the most relaxing:

   (a) Lying down
   (b) Floating
   (c) Gliding
   (d) Spending time with friends
   (e) Unwinding
   (f) Curling up in a ball
   (g) Bouncing

2. When stressed, how do you normally react?

   (a) Get very serious
   (b) Think positively
   (c) Get into arguments
   (d) Push people away
   (e) Feel incredibly tense
   (f) Explode
   (g) Recoil or shrink away

3. If you could be any of the following, which would you be?

   (a) Bowling ball
   (b) Pool noodle
   (c) Sandpaper
   (d) Magnet
   (e) Guitar string
   (f) Star
   (g) Trampoline

PERSONALITY QUIZ CONTINUED

4. If you could be a superhero, which special power would you choose:

(a) Pull things in
(b) Make objects float
(c) Make surfaces smooth or rough
(d) Push things away
(e) Create vibrations
(f) Create light
(g) Make objects bounce

5. Which word best describes you?

(a) Serious
(b) Lighthearted
(c) Easy going
(d) Alluring
(e) Uptight
(f) Unpredictable
(g) Playful

COUNT UP YOUR ANSWERS.

WHICH FORCE ARE YOU?

Mostly (a)s – gravity (refer to p. 10)
Mostly (b)s – buoyancy (refer to p. 12)
Mostly (c)s – friction (refer to p. 14)
Mostly (d)s – magnetism (refer to p. 16)
Mostly (e)s – tension (refer to p. 18)
Mostly (f)s – nuclear (refer to p. 20)
Mostly (g)s – spring (refer to p. 22)

Got a mix? You're more than one force!

WORD SEARCH

A V A W L S I I N Y Z P H G Z E G B
O T F W C D G N O G T R U I M E F O
W X E O F S Z V X S R W E Y X M R X
B K Y N R W D W S P N A E X W T I V
X X X B S C O O O R Y U V K Z G C F
F L Y M Y I E X X I J I C I P T T L
V R X R P A O O G N E S S L T I I O
F G Z R R D V N H G O C U I E Y O G
P G A F J L G H H Z Q T H U O A N N
G P M Z D Z F A W N F Q R Z O Q R Q
O F O K V D M A G N E T I S M Y H Z
B U O Y A N C Y U H G K A Q A I Q J

FORCE

MAGNETISM

GRAVITY

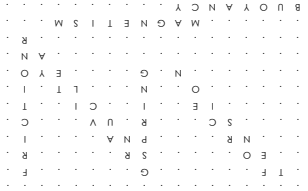
TENSION

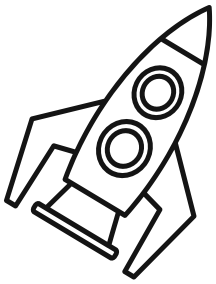
BUOYANCY

NUCLEAR

FRICTION

SPRING





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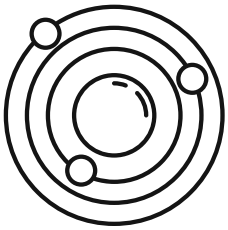
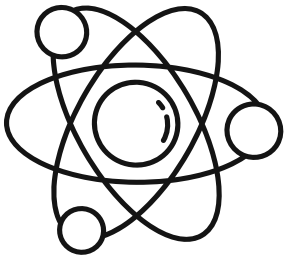


FORCE



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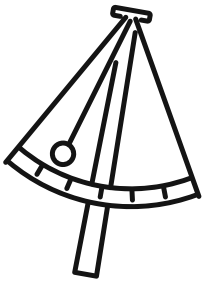

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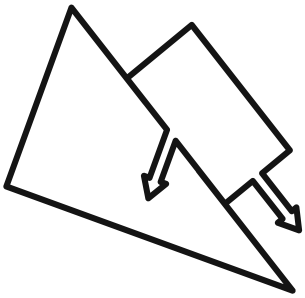

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