

LESSON 12:

MARSHMALLOW SHOOTERS

Students will learn about force and energy by making their own marshmallow shooters.

SUPPLIES

TEACHER BRINGS

- 1 bag of mini marshmallows
- 1 bag of giant marshmallows

PENCIL BOX

- Pencils
- Scissors (12)
- Markers
- Glue sticks (6)

SUPER SPY SUPPLIES

- Balloons (15)

MAIN BIN

- Toilet Paper rolls (15)

FOLDER

- Printer Paper

GADGET BOX

- Masking Tape (2)

REMEMBER

Some supplies (like tape) may need to be replenished if it's late in the semester or you share your bin with another teacher!



MEET SPECIAL AGENT

QUACKSHOT




Specialty: Precision

Agent Quackshot is the real deal. Their precision in nailing targets is unparalleled, making her a total game-changer on any mission. Even when the going gets tough, they remain calm, tackling impossible tasks like it's just another day at the office. After years of intense training and experience, she's become a total pro, a shining example for other agents to follow. Her peers look up to her, and for good reason. Whether you're on a top-secret assignment or in a high-stakes showdown, Agent Quackshot is the one you want in your corner.

OBJECTIVES

- To understand why spies may use a distraction.
- To understand how force and energy make the marshmallow shooter work.

HOOK

 3-5 min

- Sometimes a spy can get stuck in a tricky situation. They might be stuck in a room they shouldn't be in, or someone may be following them!.
- Hey, look at that! *face out the window* (While students look, move to a different place in the room). See, there wasn't really anything there, but I distracted you long enough to move. Often, spies need a distraction!
- Throwing a rock for noise or a smoke screen to escape at the perfect moment!

DISCUSSION

🕒 5-7 min

In order to stay keep their identity hidden, spies often have to use distractions to get them out of trouble quickly! Distraction techniques are a keyway that spies can do this. It can be as quick and as easy as pointing out a window before disappearing, or it may require tools to help.

Today, we will be making distraction marshmallow shooters. How do you think these will be a distraction?

Discuss how shooting the marshmallows could cause attention to focus on the flying marshmallows, giving the spy time to get away. Many marshmallows could also blur someone's vision, so a spy has time to do something secretive or get away.



HYPOTHESIS


🕒 3-5 min

Show students the supplies and ask them:

- How do you think you will use the materials to make a marshmallow shooter?
- How will the marshmallow shooter work?



ACTIVITY PART 1

 10-15 min

1. Give each student a toilet paper roll, a balloon.
2. Have students start by tying a knot in the uninflated balloon.
3. Cut the balloon in half. Discard the top, rounded part and keep the end with the tie.
4. Stretch the open-ended piece of the balloon over one end of the T.P. Roll.
 - Students may like to secure their balloon in place with tape.
5. The marshmallows are then loaded into the open side.
6. Once all students have made their marshmallow shooters, have them line up in groups of four about 3 feet away from a cardboard box. (or any target you choose)
7. Students will take turns pulling the knotted end of the balloon back and releasing it to shoot the marshmallows.
8. Encourage students to be precise with how they launch.

IMPORTANT: Only hand out the marshmallows when you are ready for the students to launch and they can be supervised

ACTIVITY PART 2

Encourage students to try different variations of the shot:


- Giant Marshmallows
- Clumps of marshmallows
- Pulling back further, or less pull back

Lastly, you can have the students wrap paper around the toilet paper roll and mark the areas to cut around it.

- They can then tape the paper to the roll and decorate their shooter how they would like!



OBSERVATION & EXPLANATION

 5-7 min

Ask students to observe:


- How does the marshmallow shooter work?
- How did the pull of the balloon affect the distance traveled?
- How did the angle of the shooter affect the distance traveled?

Explain to students that when they pull the balloon back, they are exerting force. When they hold the balloon in place after pulling it back, it is **potential (stored) energy**. As they let the balloon go, the energy becomes kinetic energy, and the force is transferred to the balloon which pushes the marshmallows out and into the air!

The further back they pulled the balloon, the more force exerted and the further the marshmallows traveled.

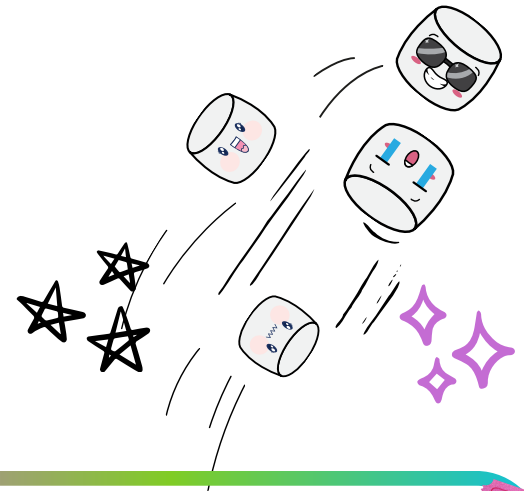
The angle of the marshmallow shooter can also affect the distance travelled. If it is point down, the marshmallows will travel into the ground rather than going a distance. If the marshmallow shooting is pointed too close to 90 degrees, the marshmallows will travel straight up in the air and down!

CONCLUSION

 3 min

Complete Exist Ticket Activity.

Then, have them explain how the marshmallow shooter works.



Exit Ticket



Ask each student one of the following questions as they walk out the door.

- Ask students to explain why spies use distraction techniques.
 - Distraction techniques serve as powerful tools for spies, allowing them to divert attention, maintain stealth, disrupt security measures, create opportunities, and manipulate the psychological responses