

LESSON 9: SPY SCOPES

SUPPLIES

PENCIL BOX

- Scissors
- Scotch Tape
- Markers

MAIN BIN

- Mirrors, 2" square (30)
- Masking Tape (2)

FOLDER

- Cardstock Spy Scope Templates (20)
- Printer Paper (20)


OBJECTIVES

- Create a spy scope using a template and mirrors.
- Understand how the angle of the mirrors allows for different images and views.

HOOK 2 min

- Do you know how a submarine is able to see what is above the water while staying below the waves? They use something called a periscope! A periscope is a tool that uses two mirrors placed at angles inside a tube to reflect light, letting you see over walls, around corners, or above the ocean surface without moving your head!

INTRODUCTION

 3-5 min

Welcome back, agents. While intelligence gathering, every Agent needs special gadgets. Have you ever wanted to see around corners or over tall objects without being seen yourself? That's where a spy scope comes in!

A spy scope lets you see things that are out of sight by using mirrors. Today, we will all make spy scopes, and then we'll test them out to see how far you can see without being seen!


MEET TODAY'S SECRET AGENT:



Specialty: Espionage and intelligence gathering

Agent Lux specializes in espionage and intelligence gathering. With their sharp senses and stealthy movements, they excel at infiltrating high-security locations and extracting classified information without leaving a trace. They possess an uncanny ability to blend into the shadows and go unnoticed, making them the perfect agent for covert missions.

DISCUSSION

 3 min


Explain that spies often want to see what someone else is doing, without being seen. By using a device like a periscope, they can see further away, around corners or even through keyholes in doors!

A spy scope, sometimes known as a periscope, is a device that uses mirrors to see objects that are otherwise out of sight. The placement of the mirrors allows someone to see things without being seen themselves.

Periscopes are also used on submarines. Which part of a submarine do you think is a periscope? It's the part that sticks out of the water! Today, we will learn about how mirrors work in order to create our own spy scope.

Show students the spy scope template, and let them know that each scope will have two mirrors. Ask students where they think the mirrors will go.

ACTIVITY

 30 min


1. Hand out the Spy Scope template to students. Be sure not to hand out scissors yet!
2. Read through instructions with the students before starting, so they are aware of the whole process.
 - o Do not cut dotted lines!
 - o Cut all thick black lines
 - o Crease dotted lines, then fold
 - o Use tabs and tape the spy scope together
 - o Peel off white tab on 2 mirrors, revealing sticky sides
 - o Stick mirrors into each side facing each other.
3. Pass out scissors and have students cut out the template.
4. Next, instruct students to fold the paper on the dotted lines. Put tape on the tabs to glue/tape the scope together.
5. Attach a mirror to the squares at each end. Students may need assistance with this step. **Make sure the mirrors are facing towards each other!**
6. Now that the spy scopes are made, encourage students to decorate them however they like! Pass out printer paper, markers, glue sticks, and scissors. See example.

FUN FACT!

The word periscope derives from two Greek words. "Peri" means "around," and "scopus" means "to look." Put them together and you get "look around!"



ACTIVITY CONTINUED

 10-15 min

Tip: It is easier to cut out and decorate blank printer paper and then glue it to the spy scope, than trying to draw directly on the spy scope. Encourage students to have fun with their designs. If they need inspiration, recommend creating camouflage for a specific environment. Bright white paper isn't very camouflaged, unless you are using your spy scope in the snow! How would you color your periscope for use in the forest? What about underwater?

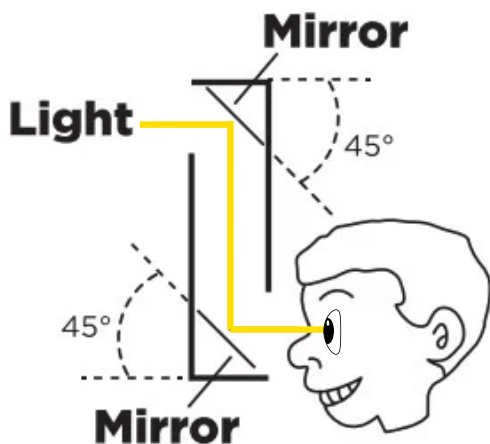
Once students have built their spy scope, encourage them to use it in the classroom. Ask them to observe:

- What can they see in front of them without the periscope?
- What can they see when looking ahead with the periscope?
- How do they think the view changes?
- What is the role of the mirrors?

OBSERVE & EXPLAIN 5-7 min

How did your view change when you looked through the periscope? Review with students that they should have been able to see things that were out of view.

How do you think the periscope works? The spy scope worked because inside the periscope, the mirrors were placed at 45-degree angles, facing each other. Light hits the top mirror at a 45-degree angle and then reflects the image at a 45-degree angle, bouncing onto the second mirror. The image hits the second mirror at a 45-degree angle, which then reflects the image into your eye. That's a lot of angles!

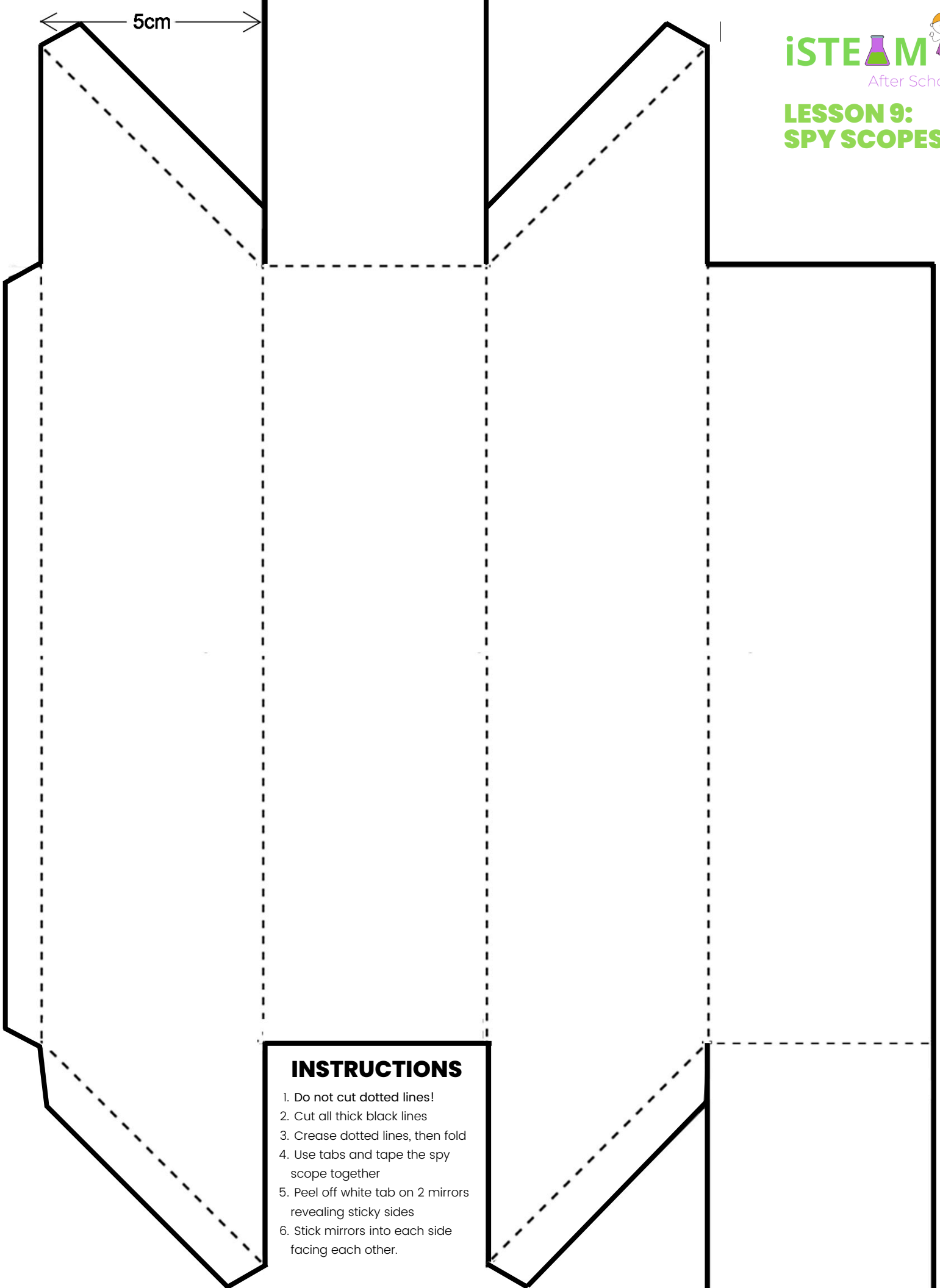


Exit Ticket



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

- Q: Why do spies use periscopes?
 - A: To see things that are out of view, without being seen themselves.
- Q: How do the mirrors work in a periscope?
 - A: They are at 45-degree angles. The top mirror reflects an image to the bottom mirror, which then reflects it to your eye.



INSTRUCTIONS

1. Do not cut dotted lines!
2. Cut all thick black lines
3. Crease dotted lines, then fold
4. Use tabs and tape the spy scope together
5. Peel off white tab on 2 mirrors revealing sticky sides
6. Stick mirrors into each side facing each other.