Name & Surname: _____ Class: _____ Date: _____

# Shadows and Daylight

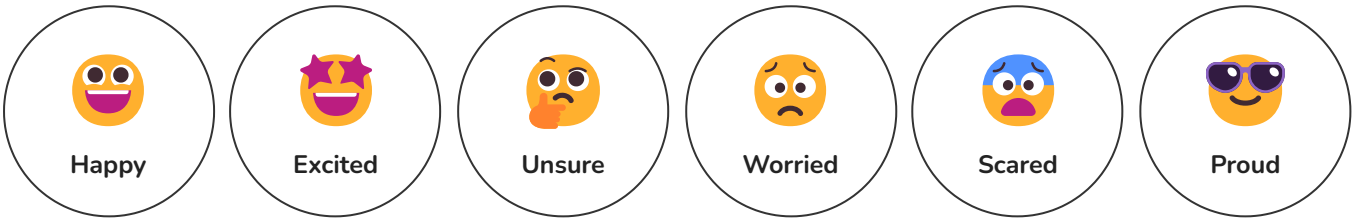
Graph shadows and spot sky patterns!

About 60 minutes Level ★★★☆☆

## Task A

**Circle a face about tracking shadows. Then write why you feel that way.**

How do you feel about graphing **shadow** data?




**Why do you feel like this?**

.....

.....



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# Track a Shadow

Do a shadow test and graph your results.

**Key words**

**shadow:** dark shape when light is blocked

**orbit:** travel around the Sun

**season:** spring, summer, fall, or winter

**rotate:** spin around a center line

**graph:** picture that shows numbers

## Task B

/3

**Test how shadow length changes. Measure, then make a bar graph.**

**Aim** See how shadow length and direction change.

**You will need**

- ☐ flashlight
- ☐ pencil
- ☐ white paper
- ☐ ruler in inches
- ☐ tape

⚠ **Stay safe**

- Do not shine light in eyes
- Tell teacher if glass breaks

**Method**

1. Tape the pencil upright in the center of the paper.
2. Put the flashlight low on the left for 9 a.m. Mark the shadow end.
3. Put the flashlight high overhead for 12 p.m. Mark the shadow end.
4. Put the flashlight low on the right for 3 p.m. Mark the shadow end.
5. Measure each shadow in inches and draw a bar graph.

| Time: 9 a.m., 12 p.m., 3 p.m. | Shadow length in inches | Shadow direction |
|---|---|---|
| | | |
| | | |
| | | |

1. Which time had the shortest **shadow**?

2. What **pattern** does your bar graph show?

3. Why does **night** happen?



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# Day Versus Night

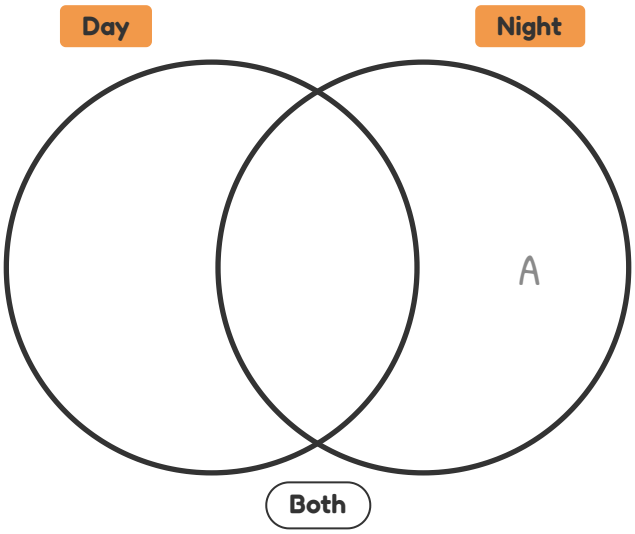
Sort facts about day, night, and sky patterns.

## ↑↓ Task C

Example done for you

/5

**Sort each fact about day and night. Write left, right, or both.**




- **A** ~~Sky is **dark** and stars can be seen~~
- **B** **Earth** turns and causes the change
- **C** **Shadows** change in length and direction
- **D** Light patterns repeat in a **cycle**
- **E** Some **stars** show only in summer or winter
- **F** **Sun** lights up the sky



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# Judge the Graphs

Think hard about good shadow graphs.

## Task D

**Judge the shadow graphs with four hats. Write short notes.**

Two bar graphs of shadow length

| | Red hat: feelings | Yellow hat: good points | Black hat: bad points | Green hat: ideas to improve |
|---|---|---|---|---|
| **Graph A: neat bars with labels in inches** | | | | |
| **Graph B: bars with no labels or title** | | | | |

## Task E

**Pull ideas to decide the best test. List reasons for each side.**

Should we track real Sun shadows outside all day or use a flashlight in class?

| | |
|---|---|
| | |
| | |
| **Track outside all day** | **Use flashlight in class** |

**What if...?**



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# Words and Questions

Fix key words and help with sky questions.

**Task F** Example done for you /4

**Unscramble each sky word. Use the clue to help.**

O H W A S D — Dark shape when light is blocked

SHADOW

P R A G H — Picture that shows numbers

R E T O T A — Spin like Earth each day

R O T B I — Travel around the Sun

A N O S E S — Spring, summer, fall, or winter



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# Shadows and Daylight

## Task G

/3

**Help three students with shadow and star questions. Write short answers.**



Student A

Why is my **shadow** long in the morning?

Why can't we see the **Sun** at night?



Student B



Student C

Why do we see different **stars** in summer and winter?

## How did I do?

Circle a face for each line.

I can graph shadow length and direction to find daily patterns.

I can explain day and night as Earth turns.

I can explain why some stars are seasonal.



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# Answer sheet: Shadows and Daylight

**Task A**

Answers will vary.

**Task B**

1. 12 p.m. had the shortest shadow.
2. Long, then short, then long, like a U shape.
3. Night happens when our side of Earth turns away from the Sun.

**Task C**

Day only: C, F
Both: B, D
Night only: A, E

**Task D**

Answers will vary.

**Task E**

Answers will vary, e.g. Outside shows real daily shadow change.

**Task F**

1. SHADOW
2. GRAPH
3. ROTATE
4. ORBIT
5. SEASON

**Task G**

1. Student A: The Sun is low, so it makes a long shadow.
2. Student B: Our side of Earth faces away from the Sun.
3. Student C: Earth orbits the Sun, so we face different stars.

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