Solar Energy at Night: Can Mirrors Move Sunlight to the Dark Side of the Earth?

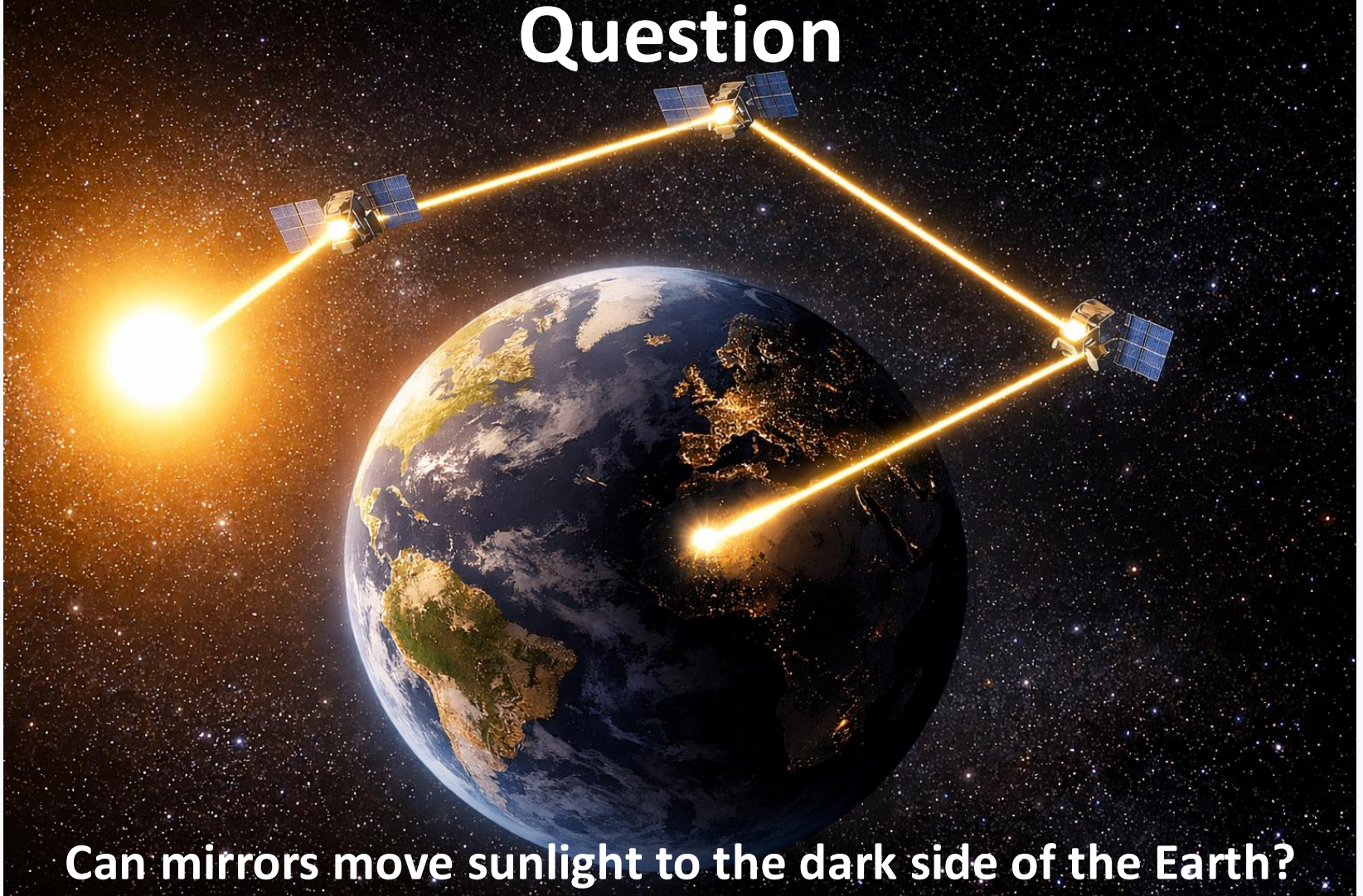
Why Is This Important?

Some places on Earth are dark at night

Solar panels only work when there is sunlight

Maybe mirrors in space could help send sunlight to dark places.

Question



Can mirrors move sunlight to the dark side of the Earth?

Background

- Light travels in straight lines.
- Mirrors reflect light.
- Changing mirror angle changes light direction.

Hypothesis

If mirrors reflect sunlight, then light can reach the dark side of the Earth.

Materials

Foam ball (Earth)

Lamp (Sun)

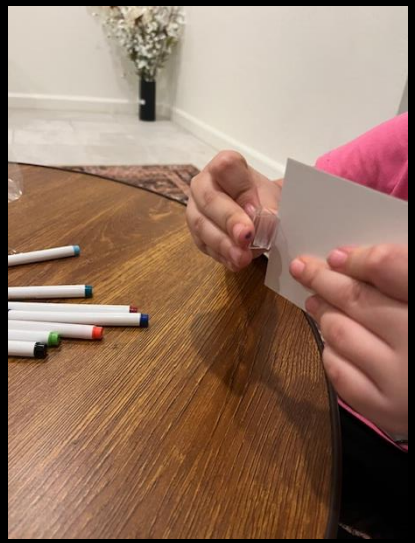
Small mirrors

Plastic stands

Markers

How I Set Up the Model

- The foam ball represented Earth.
- I colored the ball to look like the Earth.
- Small mirrors are inserted on the stand.
- The lamp acted like the Sun.



Experimental Procedure

1. Turn on the lamp.
2. Place Earth in front of the lamp.
3. Position mirrors around Earth.
4. Aim a mirror at a dark area.
5. Move the mirror and observe light movement.
6. Repeat with different positions.

Results

- When I changed the angle of the mirror, the bright spot moved to a different location.
- Small movements of the mirror caused large changes in where the light landed.
- Using more than one mirror showed that light could be moved step by step.
- The “X” mark that was in the dark became bright when the mirror was positioned correctly.
- When I tried different mirror positions, I was able to control where the light went.

Conclusion

Hypothesis confirmed

Mirrors successfully redirected light to dark areas.

Space mirrors

Satellites could send sunlight to dark areas on Earth.

Control light

Mirror angles control where light goes.

Challenges & Improvements

- It might need many mirrors.
- Next time measure brightness quantitatively.

References

1- Reflect Orbital Website (This company develops the technology shown in the project).

2- AI (CGPT 5.2) was used to generate the schematics and helped with slides preparation.