

EXPLORING THE PHASES OF THE MOON IN NIGHT OF THE MOON: A MUSLIM HOLIDAY STORY

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AUDIENCE

THIS LESSON IS EASILY ADAPTED FOR STUDENTS IN KINDERGARTEN THROUGH FIFTH GRADES.

PURPOSE

THIS LESSON EXPLAINS THE CHANGES IN THE APPEARANCE OF THE MOON AND OFFERS FURTHER FOCUS ON THE IMPACT OF PERSPECTIVE. WHILE IT MAY APPEAR THAT THE MOON IS FLAT TO US, EVEN CHANGING SHAPE, IT IS ACTUALLY OUR PERSPECTIVE OF THE MOON WHICH CHANGES.

TIME APPROXIMATELY 45 TO 60 MINUTES

OBJECTIVES

1. WHEN ASKED IF THE MOON IS FLAT, STUDENTS WILL EXPLAIN THAT IT IS ROUND, LIKE THE EARTH.
 2. STUDENTS WILL IDENTIFY THAT IT IS THE SUN THAT HELPS US SEE THE MOON AND IT DOES NOT ACTUALLY CHANGE SHAPE.
 3. WHEN ASKED TO COMPARE THE MOON TO A THREE DIMENSIONAL OBJECT OR A FLAT SHAPE, STUDENTS WILL BE ABLE TO SELECT A SPHERE, OR EXPLAIN THAT IT IS LIKE A CIRCLE ONLY ACCORDING TO OUR PERSPECTIVE.
 4. WHEN ASKED IF A "FULL MOON" IS ACTUALLY THE ENTIRE MOON, STUDENTS WILL EXPLAIN THAT IT ONLY THE SIDE WE CAN SEE.
- FOURTH AND FIFTH GRADERS (THE ABOVE PLUS)
5. WHEN PROVIDED THREE BALLS, STUDENTS WILL BE ABLE TO CREATE A MODEL TO EXPLAIN THE PHASES OF THE MOON.

STANDARDS

ARIZONA STATE SCIENCE STANDARDS

STRAND 1: INQUIRY PROCESS

CONCEPT 1: OBSERVATIONS, QUESTIONS, AND HYPOTHESIS

STRAND 2: HISTORY AND NATURE OF SCIENCE

CONCEPT 1: HISTORY OF SCIENCE AS A HUMAN ENDEAVOR

PO1 GIVE EXAMPLES OF HOW DIVERSE PEOPLE USE SCIENCE IN DAILY LIFE

STRAND 6: EARTH AND SPACE SCIENCE

CONCEPT 2: OBJECTS IN THE SKY

IDENTIFY OBJECTS IN THE SKY

CONCEPT 3: EARTH IN THE SOLAR SYSTEM

NATIONAL SCIENCE EDUCATION STANDARDS

D. EARTH AND SPACE SCIENCE- EARTH AND SPACE SCIENCE FOCUSES ON SCIENCE FACTS, CONCEPTS, PRINCIPLES, THEORIES, AND MODELS THAT ARE IMPORTANT FOR ALL STUDENTS TO KNOW, UNDERSTAND, AND USE.

E.D. 2 OBJECTS IN THE SKY

E.D. 3 CHANGES IN THE SKY

MATERIALS

FLIP-BOOKS FOR EACH STUDENT

FLASHLIGHT (AND ABILITY TO MAKE A ROOM DARKER)

THREE BALLS OF DIFFERING SIZES (A BLOW UP EARTH BALL WOULD BE A GREAT PROP)

YOU WILL NEED MORE BALLS AND FLASHLIGHTS IF YOU WISH TO DIVIDE STUDENTS INTO GROUPS TO RECREATE THE MODEL OF THE LUNAR PHASES IN SMALLER GROUPS. THIS IS RECOMMENDED FOR OLDER STUDENTS DEPENDING ON MATURITY AND ABILITY TO REMAIN FOCUSED ON THE TASK.

LESSON PROCEDURE

1. ASK STUDENTS TO REFLECT ON "NIGHT OF THE MOON" AND THE PHASES OF THE MOON. WHAT WAS HAPPENING WITH THE MOON IN THE BOOK? FLIP THROUGH THE PICTURES IF NEEDED.
2. USING WHAT STUDENTS REMEMBER AND THE PICTURES, DRAW THE PHASES OF THE MOON ON THE BOARD.
3. ASK STUDENTS WHAT PATTERNS THEY SEE.
4. ASK IF THE MOON IS REALLY GETTING SMALLER AND BIGGER. EXPECT YOUNGER STUDENTS TO BELIEVE THE MOON DOES CHANGE SIZE. IF STUDENTS DO BELIEVE THE SIZE IS CHANGES, ASK IF THEY HAVE EVER NOTICED THAT SOMETHING BIG THAT IS FAR AWAY SEEMS SMALL, WHEN THE SIZE DID NOT CHANGE (DEMONSTRATE AS NEEDED). EXPLAIN THAT

THE MOON IS LIKE A PLANET IN THAT IT DOES NOT CHANGE MUCH IN SIZE AND SHAPE.

5. USE TO STUDENTS TO EXPLAIN HOW THE MOON ORBITS THE EARTH. FOR OLDER STUDENTS YOU MAY DISTINGUISH BETWEEN ROTATION (THE SPINNING OF THE EARTH) AND REVOLUTION (GO AROUND). HAVE ONE STUDENT STAND IN PLACE, SPINNING, WHILE THE OTHER STUDENT SLOWLY WALKS IN A CIRCULAR PATH AROUND THE SPINNING STUDENT.
6. HAVE ANOTHER STUDENT PARTICIPATE AS THE SUN. IF IT IS A BOY, YOU MAY POINT OUT THAT THE SUN IS SOMEONE'S SON, TYING INTO THE HOMOPHONE EXTENSION ACTIVITY. HAVE THE "MOON" CONTINUE TO CIRCULATE AROUND THE "EARTH" WHILE THE "EARTH" BEGINS ITS ORBIT AROUND THE SUN. YOU MAY NEED TO HAVE THE "EARTH" STOP SPINNING, UNLESS THAT STUDENT IS ABLE TO REVOLVE AND ROTATE SIMULTANEOUSLY WITHOUT CRASHING INTO THE "MOON." IF THIS IS A REVIEW, CONTINUE WITH THE LESSON. IF THIS IS NEW INFORMATION, YOU MAY WISH TO HAVE ALL THE STUDENTS TAKE TURNS "ACTING" THIS SCENARIO.
7. INTRODUCE YOUR BALLS AS EARTH, MOON, AND SUN. USE THREE STUDENTS TO RECREATE THE REVOLVING/ROTATING SCENARIO WITH THE BALLS HELD OVER THEIR HEADS.
8. NEXT, ASK STUDENTS IF THE SUN STOPS SHINING AT NIGHT. ONCE STUDENTS DETERMINE THAT IT IS THE ROTATION OF THE EARTH THAT BRINGS THE CHANGE IN LIGHT (NIGHT AND DAY) ASK WHAT IT IS WE SEE WHEN WE SEE THE PHASES OF THE MOON. WHAT MAKES IT LIGHT UP? WHEN STUDENTS RECOGNIZE THAT THE SUN PROVIDES THAT LIGHT, INTRODUCE THE FLASHLIGHT AS THE SUN DIMMING THE LIGHT IN THE ROOM.
9. IF THE MOON DOESN'T ACTUALLY CHANGE SHAPE, WHY DOES IT LOOK LIKE DIFFERENT SHAPES? MOVE THE BALLS INTO DIFFERENT POSITIONS AND USE THE FLASHLIGHT TO MODEL HOW THE PLACEMENT OF THE BALLS (MOON, SUN, EARTH) AFFECTS THE AMOUNT OF LIGHT REFLECTING ON THE MOON.
10. FOR OLDER STUDENTS BREAK INTO GROUPS TO EXPLORE THE PHASES OF THE MOON. HAVE GROUPS TASKED WITH DETERMINING WHAT CONDITIONS CREATE A FULL MOON, ANOTHER GROUP WITH THE "NEW" MOON, AND ANOTHER GROUP WITH THE CRESCENT. THEN HAVE GROUPS SHARE THEIR RESULTS. FOR YOUNGER STUDENTS, HYPOTHESIZE AS A WHOLE GROUP AND SHOW THE PHASES.
11. TO CONCLUDE THIS PORTION OF THE LESSON, ASK STUDENTS IF THEY YOUR LOCATION ON THE EARTH AFFECTS THE PHASE OF THE MOON YOU SEE. IF YOU ARE IN TUCSON OR AFGHANISTAN WILL YOU SEE THE SAME

PHASE OR DIFFERENT PHASES? WHY? STUDENTS MAY NEED TO DELIBERATE ON THIS FOR HOMEWORK TOO.

EXTENSION

HOMEWORK: MOON FLIP BOOKS

DEPENDING ON THE AGE OF THE STUDENT, YOU MAY WISH TO HAVE THE FLIP BOOKS ALREADY MADE, OR HAVE STUDENTS CREATE THEM. EACH PAGE NEEDS TO HAVE A CIRCLE TRACED OR STAMPED ONTO IT IN THE SAME POSITION ON EACH PAGE. THEN STAPLE APPROXIMATELY THIRTY PAGES (EACH ABOUT THE SIZE OF A QUARTER OF A SHEET) TOGETHER FOR THE BOOKLET.

1. GIVE STUDENTS MOON BOOKLETS TO TAKE HOME. HAVE THEM SHADE THE PORTION OF THE MOON THEY SEE EVERY NIGHT AND BRING IT BACK TO CLASS EACH DAY (OR AT LEAST EACH WEEK IF YOUR HOMEWORK IS COMPLETED ON A WEEKLY BASIS).
2. EVERY FEW DAYS, HAVE THE STUDENTS' SHARE THEIR PICTURES OF THE MOON WITH EACH OTHER.
3. AT THE END OF THE MOON'S CYCLE, STUDENTS LABEL THE NEW MOON, FULL MOON, WANING AND WAXING MOONS. IF THEY FLIP THROUGH THE PAGES QUICKLY, THEY WILL HAVE CREATED A "FLIP" BOOK, WHICH MAKES THE MOON LOOK LIKE IT GROWS AND SHRINKS.

CLASSIFYING & EXAMINING PATTERNS

EXAMINE THE PATTERN OCCURRING AS THE MOON APPEARS TO GROW (WAXING) AND SHRINK (WANING). TEACH STUDENTS THE VOCABULARY, WAXING, WANING, GIBBOUS, AND CRESCENT.