

Get an Angle on the Stars

Target Standard Measurement

- Understand measurable attributes of objects and the units, systems, and processes of measurement
- Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute

Prior Knowledge

Students should have experience with lines, rays, line segments, and points.

Teaching Plan

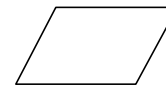
Background

Polygons are closed figures formed from line segments that meet only at their endpoints. For example, a triangle is a 3-sided polygon. Quadrilaterals are closed, 4-sided figures made of line segments (examples are a trapezoid, a parallelogram, a rectangle, a rhombus, and a square).

Trapezoid: a quadrilateral with two parallel sides.



Parallelogram: a four-sided plane figure with opposite sides parallel.



Rectangle: a parallelogram with 4 angles of 90° .



Square: a parallelogram with four equal sides and angles of 90° .



Rhombus: a parallelogram with usually non-right angles and four equal sides.



Materials

Ursa Major Activity Sheet
Ursa Major overhead transparency
Index cards or cardstock strips
Brads

Implementation

Part 1

Find Polygons within Ursa Major

1. Identify all the polygons that can be created from the **Ursa Major** constellation. Students record their answers in the **Angle on Stars** activity sheet. *note* → use an overhead of *Ursa Major*

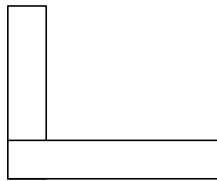
Possibilities: *figure: D, A, G, B*
figure: D, A, R, N, F, X, G
figure: D, G, X, F, N, O, R, A
figure: R, O, N

- After the polygons have been identified and discussed, ask the students what they notice about the closed figures. *note*→ *the closed figures in the constellation have corners.* What is a corner? When you look at corners, you are looking at angles? Encourage students to identify angles in the room. What similarities or differences can be observed?
note→ *pay attention to the clock hands*

Part 2

Construction of tools for comparing angles and classifying angles

- Students measure and cut 4 cardstock strips (or index cards) approximately 10 cm long and 2 cm wide.
- After cutting the strips, have them glue 2 of the strips together forming a 90-degree angle. This will be their benchmark:



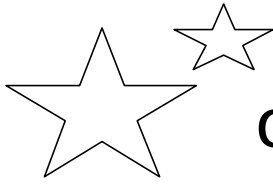
- For the second set of strips, punch a hole in the end of the strips large enough to fit a brad. Put in a brad to make a moveable angle tool. Students will use this tool as they compare the angles in the constellation.
- Discuss that corners are normally 90-degree angles.
note→ *A right angle is a 90° angle, used as the standard for comparison*
An acute angle is less than 90°
An obtuse angle is greater than 90°
- Demonstrate the correct way to write the symbol for angle (\angle).
example→ *$\angle DEAB$, where A is the vertex of the angle.*
note→ *Teacher could use transparency angle instruments for use with the overhead projector to demonstrate the angles and the vocabulary*
- Students classify angles as right, obtuse, or acute in the classroom or go on a scavenger hunt on the playground. They record their finding on the **Angle on Stars** activity sheet.

Part 3

Identification of obtuse and acute angles

Using the Star Map of **Ursa Major**, students identify 3 obtuse and 3 acute angles. Answers are recorded on the **Angle on Stars** activity sheet.

option→ *older students can use a protractor to give exact measurements of these angles.*



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Part 1 List as many polygons as possible from the Star map of Ursa Major using letters

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Part 2 Classifying Angles

List four obtuse angles that you have identified in your school:

1. _____
2. _____
3. _____
4. _____

List four acute angles that you have identified in your school:

1. _____
2. _____
3. _____
4. _____

Part 3 Using your Star Map of Ursa Major, locate and identify examples of the following angle types:

Obtuse

Acute

- | | |
|----------|----------|
| 1. _____ | 1. _____ |
| 2. _____ | 2. _____ |
| 3. _____ | 3. _____ |

Are there any angles or rays in the constellation Ursa Major that are the same (congruent)?

1. _____ and 2. _____

