

Ursa Major Measures

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
- Apply appropriate techniques, tools, and formulas to determine measurements
- Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature and the size of angles

Prior Knowledge

- Students should already have some knowledge and understanding of points, rays, lines, segment, vertex, and angles.
- For actual measurements of angles (older) students need to know how to use a protractor.(basic geometry vocabulary)

Teaching Plan

Background

Begin by discussing the definitions of *points, rays, and lines*. **Points** are places in space. In this activity, we will use starts to represent points, draw lines to connect them, and define vertices. In the sky, a collection of stars is called a constellation. Point sources from other applications could be introduced here as well. Points have no dimensions, are untouchable, and cannot be measured. They can be named and represented.

Using the analogy of sunlight, discuss that a star represents the point and the light it gives off traveling in a straight line becomes the **ray** (It has a starting point and continues indefinitely). Two stars in a constellation represent two points. A single beam of light connecting the two stars is an example of a line segment. Using the constellations, students can explore various components of angles. A **vertex** is the intersection point of two rays, line segments or lines forming angles. In this activity, the vertex will always be located where a star is. An angle is defined as two rays that share a point (star).

Purpose

Identify and communicate ways to describe angles and their components.

Materials

Ursa Major Constellation, copies for all students
Ursa Major Measures activity sheet

Implementation

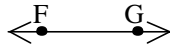
Begin with a discussion about star (don't forget the sun) brightness. Discuss how stars are identified with letters according to their apparent magnitude. Brightest stars are A (alpha). Stars of descending magnitude are identified as B (beta), G (gamma), D (delta), etc.

Using the **Ursa Major Constellation** and **Ursa Major Measures** activity sheet (transparency and copies), lead a discussion to help the children find a line segment, ray, vertex, and angle.

Teacher Information

Point •H

Line connecting two points
(extends forever)

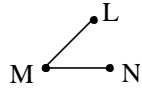


Written symbol: \overleftrightarrow{FG}

Line segment A — B

Written symbol: \overline{AB}

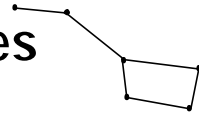
Angle



Written symbol: $\angle LMN$

Name: _____

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Part 1: Linear Measures

Using a metric ruler, mark the shortest distances between stars and record the values:

1. H and C _____
2. E and O _____
3. X and F _____
4. H and K _____
5. How many pairs of stars have about 10 mm between them? _____

Part 2: Locating lines, angles and rays

Name four of the following figures:

1. Lines _____
2. Line segments _____
3. Rays _____
4. Angles _____
5. Vertices _____

Ursa Major

