



# Web Angles

## Introduction

### Objective:

Students will construct simulated spider webs.

Student will identify and measure angles within the web.

### Academic Content Standards:

- ❖ National Council of Teachers of Mathematics Standards: Geometry
  - *Students analyze characteristics and properties of two-and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.*
  - *Use visualization, spatial reasoning, and geometric modeling to solve problems.*
- ❖ Ohio Academic Content Standards for Social Studies #3 Geometry
  - *Students identify, classify, compare and analyze characteristics, properties and relationships of one, two, and three dimensional geometric figures and objects.*
  - *Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.*
    - *Benchmarks: A and F (4<sup>th</sup> Grade)*
    - *Benchmarks: A, D, and G (5<sup>th</sup> & 6<sup>th</sup> Grades)*
- ❖ Ohio Academic Content Standards for Social Studies #6 Mathematical Processes Standard
  - *Embedded within the grade level indicators.*

## Getting Started

### Materials:

- Paper (8.5 x 11 - one per student)
- Glue
- Uncooked spaghetti
- Pencil
- Protractor

### Vocabulary:

- Angle
- Vertex
- Ray
- Protractor
- Degree
- Acute angle
- Obtuse angle
- Right angle

### Technology:

Internet access. Web links to view the many different types of spiders and their webs, and for comparison to the student made webs.

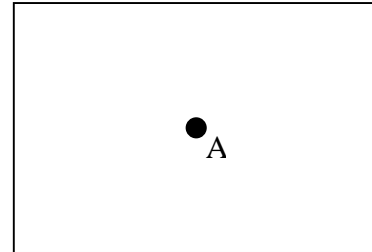
## Lesson

### Orientation Activity:

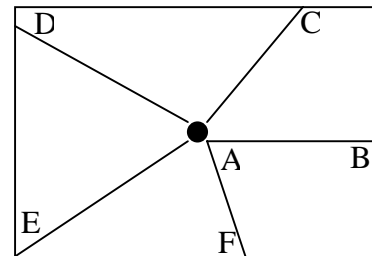
Count out 20 to 25 pieces of uncooked spaghetti per student. Students should have prior knowledge and experience using a protractor and measuring angles before making the web and measuring the angles on the web.

### Learning Activity:

Distribute one 8.5 x 11 inch paper to each student. Have them place a point in the center of the paper with a marker or pen and label it with an "A."

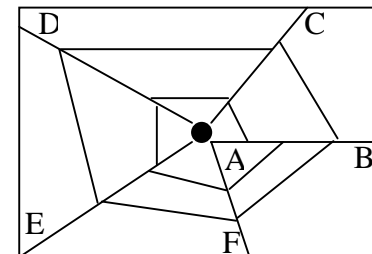


Next, ask the students to glue 4 to 7 long pieces of uncooked spaghetti onto the paper. The spaghetti pieces will radiate out from point "A". Have students label each one of the outer most points on the new line segments with letters. Once labeled, students will name all angles on the page (e.g., angle FAB, angle DAC, and angle DAE, etc.).

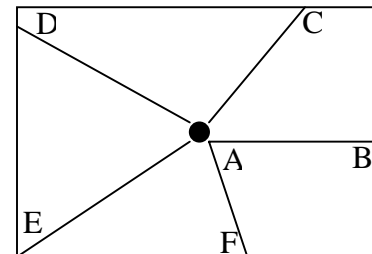


Once all angles are named, students will measure the angles with the use of a protractor. The measurements are then recorded.

Each student will next glue 2 to 3 rings of spaghetti on the paper to develop a web. Students will label several additional points on the paper and then name any new angles that are present on the page. Students will measure the new angles using a protractor and record the measurements.



Students will compare the measurements of his/her web to the measurements students calculated when measuring their webs. Students will analyze any existing relationships between the number of pieces of spaghetti radiating out from the center of the web and the size of the angles.



### Extensions

To reinforce other geometry concepts have students complete the following:

- Measure line segments on the web
- Identify types of triangles on the web
- Identify any trapezoids or parallelograms on the web
- Identify any parallel or perpendicular line segments on the web

### **Evaluation and Follow-Up**

#### Assessment Tools and Methods:

- Students will measure specific angles of a teacher generated spider web.
- Teacher will measure angles on the student webs and compare measurements to those calculated by the students.
- Students will write an essay about the relationships that exist between the angle measurements and the number of pieces of spaghetti that radiate from the center of the web.