* Introduce two-turtle model - new features.  Provide example for class to follow.
* What is congruence?  Are these shapes congruent?
  + Use two pentagons (right 72, side length 60)
* How do you know two shapes are congruent?
  + Equal sides? Equal angles? Same color (for ViMAP models)?
    - How can we know that the two shapes are congruent
* Ask the class to make two congruent shapes with their turtles - remind them of the shapes we made last class.  They can choose any shape. **HINT: side length cannot be bigger than 60-70 or else turtle 2 hits the edge of the screen.**
  + Have student show their example and have class decide if they are congruent.
* Use student example to introduce 'place-measure-point'.
  + Have the class place a measure-point in their turtle 1 commands.  Let them examine their graphs.
  + What do the bars tell you? Go over what the graphs are showing you.
  + The odometer graph is adding up all of the sides of the shape – what do we know that’s called?
* Do congruent shapes have the same perimeter?
  + Are all shapes that have the same perimeter congruent?
* Provide example of two shapes that have same perimeter but are not congruent
  + Square: step size 75, right 90 Pentagon step size 60, right 72
* Challenge the class to create two shapes that have the same perimeter but are not congruent.
* Use evidence from ViMAP to prove that shapes have the same perimeter.

1. Using two-turtle ViMAP, create two shapes that are **congruent**. Copy your code into the boxes below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Turtle 1** | | **Turtle 2** | |
| Setup | Go | Setup | Go |
|  |  |  |  |

1. How do you know that the two shapes are **congruent?**
2. Put the command “place-measure-point” into your code for Turtle 1. Draw a picture of what your **Odometer** and **Distance-Covered-Since-Last-Measure** Graphs for Turtle 1.

**Odometer Graph:**

|  |
| --- |
|  |

**Distance-Covered-Since-Last-Measure Graph**

|  |
| --- |
|  |

1. In the odometer graph, what does that last bar tell you?
2. In the Distance-Covered-Since-Last-Measure Graph, what do the bars in the graph tell you?
3. Do congruent shapes have the same perimeter? Place a measure point in your Turtle 2 code. Using the odometer graph, write down the **perimeter** of each shape:

Perimeter of Shape 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Perimeter of Shape 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Create two shapes that have the same **perimeter** but are not **congruent**. Copy your code for Turtle 1 and Turtle 2 in the boxes below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Turtle 1** | | **Turtle 2** | |
| Setup | Go | Setup | Go |
|  |  |  |  |

**Draw pictures of your two shapes in the space below.**

**Shape 1 Shape 2**

1. Copy the your graphs for Turtle 1 and Turtle 2.

**Odometer Graph Turtle 1, Shape 1:**

|  |
| --- |
|  |

**Distance-Covered-Since-Last-Measure Graph Turtle 1, Shape 1**

|  |
| --- |
|  |

**Odometer Graph Turtle 2, Shape 2**

|  |
| --- |
|  |

**Distance-Covered-Since-Last-Measure Graph, Turtle 1, Shape 2**

|  |
| --- |
|  |