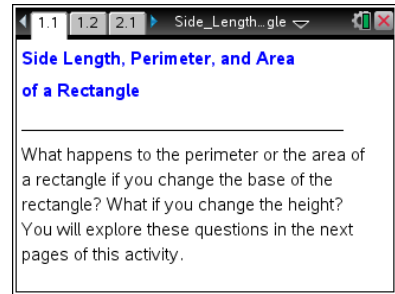**Open the TI-Nspire document**
*Side_Length_Perimeter_and_Area_of_a_Rectangle.tns.*

What happens to the perimeter or the area of a rectangle if you change the base or the height of the rectangle? What happens to the perimeter or the area if you change **both** the base and height?

> Side Length, Perimeter, and Area of a Rectangle
>
> _____
>
> What happens to the perimeter or the area of a rectangle if you change the base of the rectangle? What if you change the height? You will explore these questions in the next pages of this activity.

**Move to page 1.2.**

Press `ctrl` ▶ and `ctrl` ◀ to navigate through the lesson.

1.  Drag the point on the vertex of the rectangle to change the base. Complete the table below. Note that you are changing only the base, and the height remains constant.

| Base | Height | Perimeter | Area |
|:---:|:---:|:---:|:---:|
| 8 | | | |
| 9 | 5 | | |
| | | 20 | |
| | 5 | | 30 |

2.  As the base increases from 8 units to 9 units:

    a.  How does the perimeter change?

    b.  How does the area change?

3.  As the base increases from 5 units to 6 units:

    a.  How does the perimeter change?

    b.  How does the area change?

4.  Choose a value for the base of the rectangle.
    a.  Record the data for your base, height, perimeter, and area in the table below.
    b.   Move the point to increase the base by 3 units. Record the new measurements for base, height, perimeter, and area.

| Base | Height | Perimeter | Area |
|------|--------|-----------|------|
|      |        |           |      |
|      |        |           |      |

5.  Use the information in your table from question 4.
    a.  Describe the change in the perimeter of the rectangle when the base increased by 3 units.

    b.  Describe the change in the area of the rectangle when the base increased by 3 units.

    c.  Compare your observations with another student. What observations did you have in common?

    d.  Does it matter what base you started with? Explain.

6.  What if the base were to increase by *n* units? How would this affect the perimeter and the area?

7.  Bryson wants to change the height instead of the base to see if the perimeter and area are affected in the same way as when he changed the base. David says Bryson will get different results if he does. Who do you think is correct, and why?

**Move to page 2.1.**

8. Change the value of the height to 5 units. Press [ctrl] [.] to capture the data for the base (*b*), height (*h*), perimeter (*p*), and area (*a*). Repeat this process for the heights 6, 7, and 8.

   Use the spreadsheet to complete the table.

| *b* | *h* | *p* | *a* |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

9. a. As you did in questions 2 and 3 when increasing the base by 1 unit, describe the change in the perimeter and the change in the area of the rectangle when the height increased by 1 unit.

   b. How does this support your response for question 7?