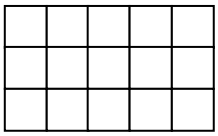
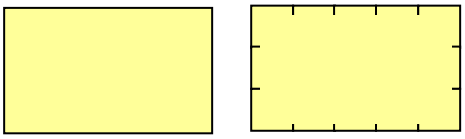
# Storyboards for Index Card Area



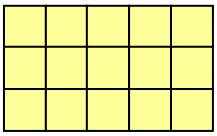
(thanks to Betty Lewis @ South Medford High School)

**rectangle**

1. mark off the 1” hash marks on the edge of the index card (index card, pencil, ruler, hand)



2. connect the hash marks to make 15 1-inch squares

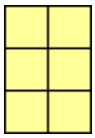


3. how many different-sized rectangles can you make? Describe each one by

    a. drawing it
    b. writing its dimensions

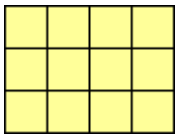
    your drawings should look something like this:

1 x 5
or
5 x 1



2 x 3
or
3 x 2

2 x 2

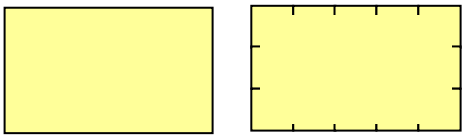


3 x 4
or
4 x 3

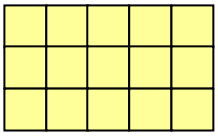
and so forth

**triangle**

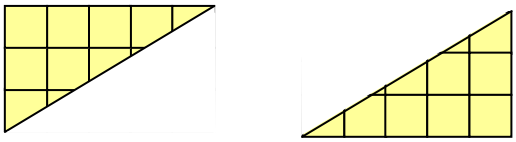
1. mark off the 1” hash marks on the edge of the index card (index card, pencil, ruler, hand)



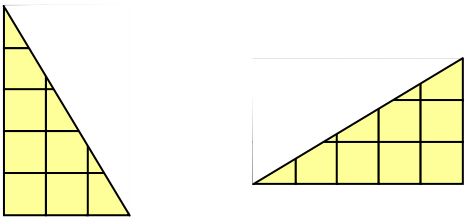
2. connect the hash marks to make 15 1-inch squares



3. cut the card diagonally, making two triangles

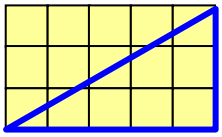


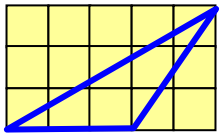
4. set them side-by-side, one oriented vertically, the other horizontally

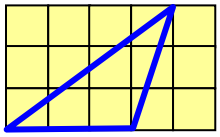


5. write a formula for calculating the area of the triangle
   (Hint: aren’t they each ½ of the original rectangle?)

6. Figure out how many squares each of these triangles covers and justify your answer in writing. (Hint: sometimes it's easier to add; sometimes it's easier to subtract.)

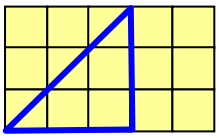


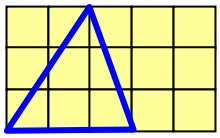


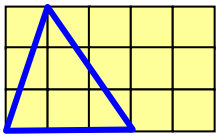


On this one I knew that the area of the whole rectangle is 15 square inches (5" x 3" = 15 sq. in.) So then I knew that the area of the triangle would be half that. A = 7½ sq. in.

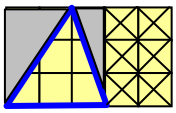
By the formula,
A= ½ (base x height)
A= ½ (5" x 3")
A= ½ (15) sq. in.
A= 7½ sq. in.



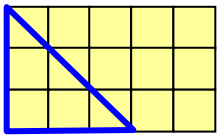


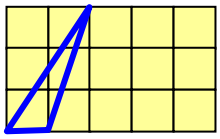


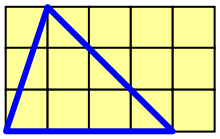
This one I decided to do by subtraction. I knew that the area of the whole rectangle is 15 square inches (5" x 3" = 15 sq. in.) Then I took off 6 for the 2 x 3 rectangle on the right. Then I took off 1½ for the little 1 x 3 triangle in the middle. Then I took off 3 for the 2 x 3 triangle on the left. So 15 –6 –1½ –3 = 4 ½ square inches.



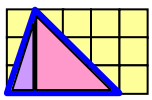
By the formula,
A= ½ (base x height)
A= ½ (3" x 3")
A= ½ (9) sq. in.
A= 4½ sq. in.





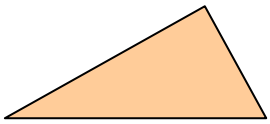


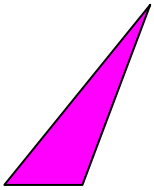
This one I decided to do by addition. The whole blue triangle is made up of a 1 x 3 triangle on the left and a 3 x 3 triangle on the right. So half of 1 x 3 is 1½ and half of 3 x 3 is 4 ½, so the area of the blue triangle is 6 square inches.



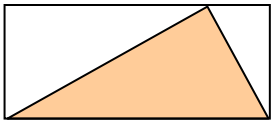
By the formula,
A= ½ (base x height)
A= ½ (4" x 3")
A= ½ (12) sq. in.
A= 6 sq. in.

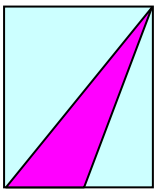
how about other triangles?



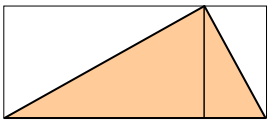


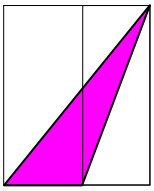
1. can you see the rectangle surrounding each of the triangles?



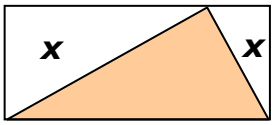


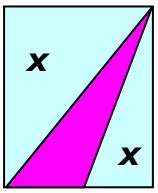
2. can you see the rectangles inside too?

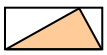
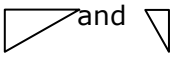




3. Since all you want is the area of the triangle, you can find out the area of the surrounding rectangle and subtract the empty areas you don't want:

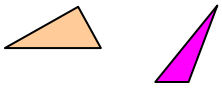


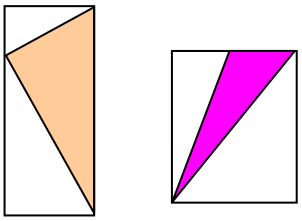

Area of  = Area of  take away  and 

Area of  = Area of  take away  and 

4. What other ways can you think of to find the ares of the two triangles?

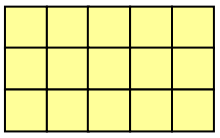


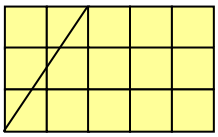
Hint: sometimes it helps you see how to do it if you rotate the object:



**parallelogram**

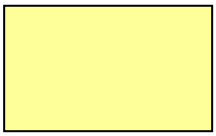
1. Draw a 1” by 1” grid on the blank side of a 3X5 index card.



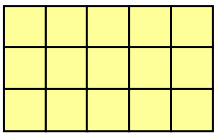


2. Draw a line segment starting 2” from the upper left corner & ending at the lower left corner. Cut along this line segment.

3. Form a **parallelogram** by moving the triangle to the right and tape the pieces together.
4. Count the number of **squares**.
5. On the same side of the card and using the appropriate units, write the numerical equation that can be used to find the number of **squares** on the card.
6. On the other side of the card, write the **formula** for finding the area of a parallelogram, using **A** for area, **b** for base, and **h** for height.



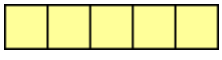
4. connect the hash marks to make 15 1-inch squares



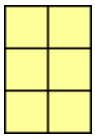
5. how many different-sized rectangles can you make? Describe each one by

    a. drawing it
    b. writing its dimensions

your drawings should look something like this:

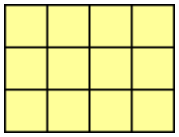


1 x 5
or
5 x 1



2 x 3
or
3 x 2

2 x 2



3 x 4
or
4 x 3

and so forth

Larry Francis
SOESD, Computer Information Services
larry_francis@soesd.k12.or.us and 541.858.6748
www.soesd.k12.or.us/support/training and www.soesd.k12.or.us/math