Find the area of plane figures using length and width by visualizing and counting unit squares

Name:

Date:

Warm-up question:

In an effort to encourage students and community members to exercise more, Einstein Elementary School is going to create a paved fitness trail around the school's campus. Determine the area of the fitness trail.
How much physical activity is needed?

Physical activity is important for everyone, but how much you need depends on your age.

**ADULTS**
(18 to 64 years)
Adults should do at least 2 hours and 30 minutes each week of aerobic physical activity at a moderate level OR 1 hour and 15 minutes each week of aerobic physical activity at a vigorous level. Being active 5 or more hours each week can provide even more health benefits. Spreading aerobic activity out over at least 3 days a week is best. Also, each activity should be done for at least 10 minutes at a time. Adults should also do strengthening activities, like push-ups, sit-ups and lifting weights, at least 2 days a week.

**CHILDREN AND ADOLESCENTS**
(6-17 years)
Children and adolescents should do 60 minutes or more of physical activity each day. Most of the 60 minutes should be either moderate- or vigorous intensity aerobic physical activity, and should include vigorous-intensity physical activity at least 3 days a week. As part of their 60 or more minutes of daily physical activity, children and adolescents should include muscle-strengthening activities, like climbing, at least 3 days a week and bone-strengthening activities, like jumping, at least 3 days a week. Children and adolescents are often active in short bursts of time rather than for sustained periods of time, and these short bursts can add up to meet physical activity needs. Physical activities for children and adolescents should be developmentally appropriate, fun, and offer variety.

**YOUNG CHILDREN**
(2-5 years)
There is not a specific recommendation for the number of minutes young children should be active each day. Children ages 2-5 years should play actively several times each day. Their activity may happen in short bursts of time and not be all at once. Physical activities for young children should be developmentally appropriate, fun, and offer variety.

Physical activity is generally safe for everyone. The health benefits you gain from being active are far greater than the chances of getting hurt. Here are some things you can do to stay safe while you are active:

- If you haven't been active in a while, start slowly and build up.
- Learn about the types and amounts of activity that are right for you.
- Choose activities that are appropriate for your fitness level.
- Build up the time you spend before switching to activities that take more effort.
- Use the right safety gear and sports equipment.
- Choose a safe place to do your activity.
- See a health care provider if you have a health problem.
Main task question:

Your class has been asked to design the new fitness center at school. The fitness center is 30 feet long by 30 feet wide and has an area of 900 square feet. Decide which fitness equipment to put in the fitness center and where to place each piece of equipment. Be sure to leave space for people to walk around and to include a door.

<table>
<thead>
<tr>
<th>Fitness Equipment</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treadmill</td>
<td>5 feet long by 3 feet wide</td>
</tr>
<tr>
<td>Elliptical</td>
<td>4 feet long by 2 feet wide</td>
</tr>
<tr>
<td>Stationary Bike</td>
<td>3 feet long by 2 feet wide</td>
</tr>
<tr>
<td>Weight bench</td>
<td>4 feet long by 3 feet wide</td>
</tr>
</tbody>
</table>
Task Debrief:

1. How did you decide what the problem was asking you to find?
2. How do the length and width of the pieces of equipment help us determine is area?
3. When designing the arrangement, what pieces should be near each other and why?
4. How much room did you leave for people to walk around in the fitness center?
5. Does the placement of the equipment make sense in relation to where your door is?
6. How much floor space (area) is left after all the pieces of equipment has been placed?
7. How does moving the equipment to a different place affect the area in the fitness center?
8. How could you prove your solution makes sense?
9. Could you prove your strategy makes sense by solving the problem in another way?
10. What are the dimensions of this shape?

11. How does the length and width of the rectangle determine its area?

Big Idea of Lesson:

Which floor plan has a larger area?

Explain how the attributes of length and width determine the area of rectangles.