Class Activity

Measurement Models

Objectives:

1. The teacher will understand how to model linear measurements and relate this to the concepts of LINEAR UNIT [= U] and length.
2. The teacher will understand how to model area measurements and relate this to the concepts of SQUARE UNIT [= U^2] and area.

Throughout this Activity:

- **Refer to your [§1] Place Value Options for Linear and Area Pieces Handout. DON'T assume what the terms mean, please look them up!**

TOPIC: LINEAR MEASUREMENT

- *Materials: BASE 10 LINEAR & AREA PIECES*

1. Look at the BLUE LINEAR PIECES. You have small linear pieces and strip linear pieces [which are 10 times LONGER than the small linear pieces].

For THIS problem we will declare the SMALL LINEAR PIECE to be ***1 linear unit***.

- Use your linear pieces to measure the following objects, be sure to model the correct configurations with the yellow area pieces before measuring [if possible].

a The length of the EDGE of a SMALL AREA PIECE is: _____ linear units

b The length of the SHORT EDGE of an AREA STRIP is: _____ linear units

c The length of the LONG EDGE of an AREA STRIP is: _____ linear units

d The length of the EDGE of an AREA MAT is: _____ linear units

e The length of the SHORT EDGE of an AREA STRIP-STRIP is: _____ linear units

f The length of the LONG EDGE of an AREA STRIP-STRIP is: _____ linear units

g The length of the SHORT EDGE of an AREA STRIP-MAT is: _____ linear units

h The length of the LONG EDGE of an AREA STRIP-MAT is: _____ linear units

i The length of the EDGE of an AREA MAT-MAT is: _____ linear units

All of the LINEAR MEASUREMENTS on this page should include units.
Example: 24 u for 24 linear units. There should be NO unit free numbers here.

2 I wish to model **24 LINEAR UNITS.** As a group, discuss how you can use your linear pieces to do this. What would model 1 LINEAR UNIT and 10 LINEAR UNITS in this case? Sketch and name the linear pieces that show 24 linear units here. Label!

3 I wish to model **240 LINEAR UNITS.** As a group, discuss how you can use your linear pieces to do this. What would model 1 LINEAR UNIT, 10 LINEAR UNITS and 100 LINEAR UNITS in this case? Sketch and name the linear pieces that show 240 linear units here. Label!

4 I wish to model **0.1 LINEAR UNITS.** As a group, discuss how you can use your linear pieces to do this. What would model 1/10 LINEAR UNIT and 1 LINEAR UNIT in this case? Sketch and name the linear pieces that show 0.1 linear unit and 1 linear unit here. Label!

5 I wish to model **2.4 LINEAR UNITS.** As a group, discuss how you can use your linear pieces to do this. What would model 1/10 LINEAR UNIT and 1 LINEAR UNIT in this case? Sketch and name the linear pieces that show 2.4 linear units here. Label!

Still label all of the LINEAR MEASUREMENTS

6 I wish to model **0.24 LINEAR UNITS.** As a group, discuss how you can use your linear pieces to do this. What would model 1/100 LINEAR UNIT, 1/10 LINEAR UNIT and 1 LINEAR UNIT in this case? Sketch and name the linear pieces that show 0.24 linear units here. Label!

7 What would be your linear unit if you wanted to model **0.024 LINEAR UNITS?**

8 What would be your linear unit if you wanted to model **0.0024 LINEAR UNITS?**

TOPIC: AREA MEASUREMENT

- *Materials: BASE 10 LINEAR & AREA PIECES*

8. Look at the AREA PIECES. You have small area pieces, strip area pieces [which are 10 small area pieces in a row] and mat area pieces [a 10 x 10 small area piece configuration].

For THIS problem we will declare the SMALL AREA PIECE to be ***1 area unit [1 u^2]***.

- Use your area pieces to measure the following objects, be sure to model the correct configurations with the area pieces before measuring [if possible].

a The area measure of the SMALL AREA PIECE is: _____ area units

b The area measure of the AREA STRIP is: _____ area units

c The area measure of the AREA MAT is: _____ area units

d The area measure of the AREA STRIP-STRIP is: _____ area units

e The area measure of the AREA STRIP-MAT is: _____ area units

f The area measure of the AREA MAT-MAT is: _____ area units

All of the LINEAR MEASUREMENTS (EDGES) and all of the AREA MEASUREMENTS (Yellow FACES) on this page should include units.
Example: 24 u^2 for 24 area units. There should be NO unit free numbers here.

10 I wish to model **24 AREA UNITS.** As a group, discuss how you can use your area pieces to do this. What would model 1 AREA UNIT and 10 AREA UNITS in this case? Sketch and name the area pieces that show 24 area units here. Label everything, including the linear lengths of the edges of the area pieces.

11 I wish to model **240 AREA UNITS.** As a group, discuss how you can use your area pieces to do this. What would model 1 AREA UNIT, 10 AREA UNITS and 100 AREA UNITS in this case? Sketch and name the area pieces that show 240 area units here. Label everything, including the linear lengths of the edges of the area pieces.

HINT! Before you draw anything be sure to look at your edge lengths. Use the linear pieces to measure. Your AREA UNIT should be 1 linear unit x 1 linear unit ($1u \times 1u = 1u^2$).

12 I wish to model **0.1 AREA UNITS.** As a group, discuss how you can use your area pieces to do this. What would model 1/10 AREA UNIT and 1 AREA UNIT in this case? Sketch and name the area pieces that show 0.1 area unit AND 1 area unit here. Label everything, including the linear lengths of the edges of the area pieces.

13 I wish to model **2.4 AREA UNITS.** As a group, discuss how you can use your area pieces to do this. What would model 1/10 AREA UNIT and 1 AREA UNIT in this case? Sketch and name the area pieces that show 2.4 area units here. Label everything, including the linear lengths of the edges of the area pieces.

14 I wish to model **0.24 AREA UNITS.** As a group, discuss how you can use your area pieces to do this. What would model 1/100 AREA UNIT, 1/10 AREA UNIT and 1 AREA UNIT in this case? Sketch and name the area pieces that show 0.24 area units AND 1 area unit here. Label everything, including the linear lengths of the edges of the area pieces.

15 What would be your area unit if you wanted to model **0.024 AREA UNITS?**

16 What would be your area unit if you wanted to model **0.0024 AREA UNITS?**