

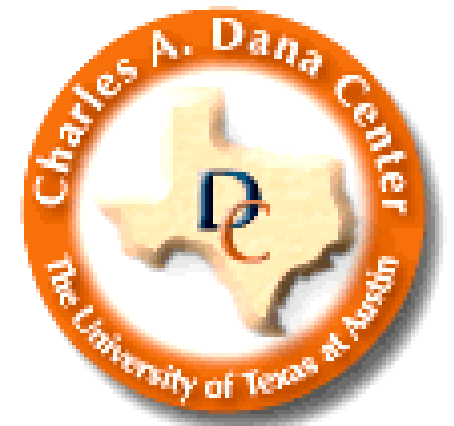
Measurement: Making the Connection Grades 6-8

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Developed by: Rhonda Bailey

The Charles A. Dana Center

CAMT, 2004

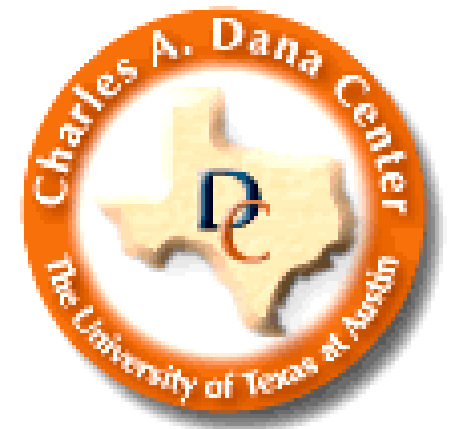


Our task is to...

Develop students' conceptualization of measurement by tackling

- perimeter,
- surface area, and
- volume

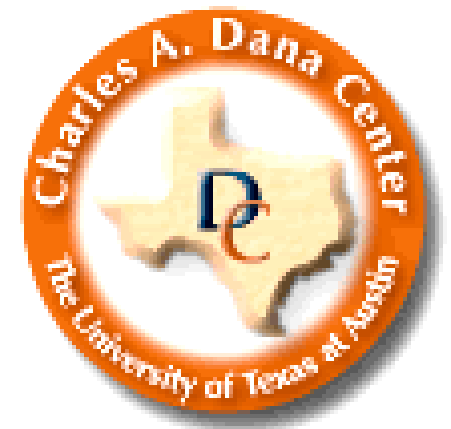
using an active, hands-on approach



Grounding thought

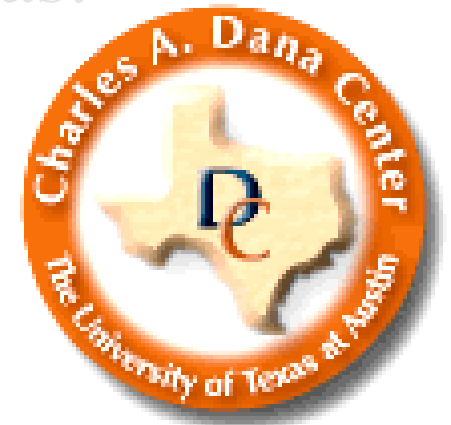
When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.

~ Lord Kelvin



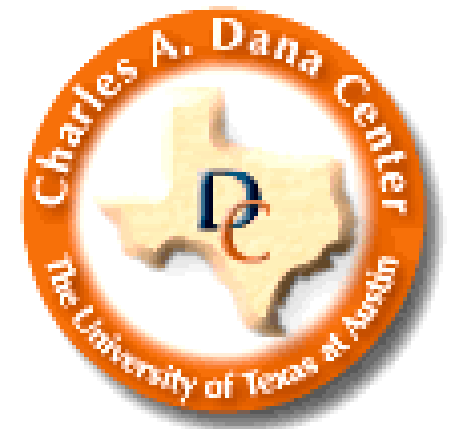
Why are we here?

TAAS & TAKS data has consistently revealed that our students need additional experiences with learning measurement concepts. Traditionally, classroom instruction on measurement has focused on measurement conversion and solving simple application problems involving formulas.



What will we do?

In this session, we will model activities for use in your classroom to help clarify your students' conceptualization of measurement.

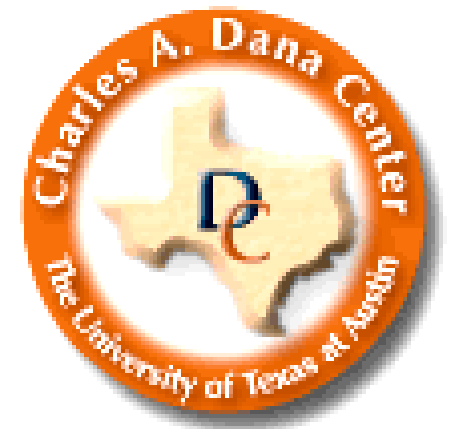


Resources

- Mathematics TEKS Toolkit

www.tenet.edu/teks/math

- Standards in the Classroom for Grades 6-9



Clarifying the Activities

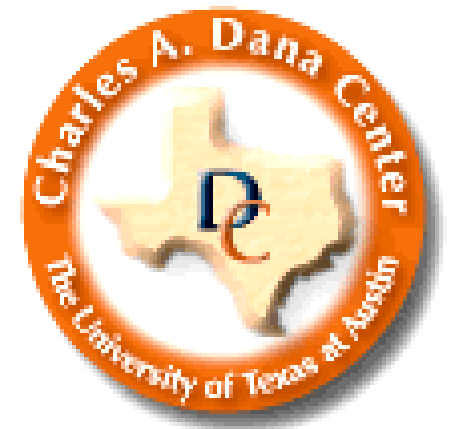
These activities have been developed to address the following TEKS:

6.8 (B)

7.9 (A)

8.8 (A), (B), and (C)

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Materials

Student Recording Sheet

Centimeter and Inch Grid Sheets

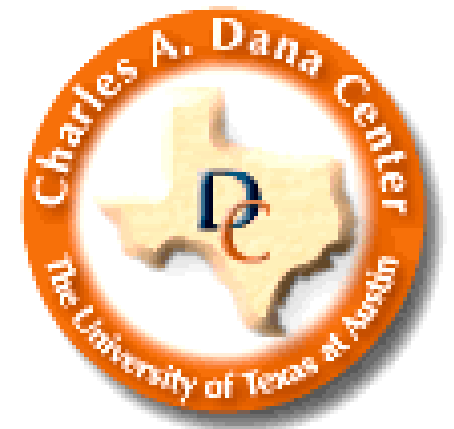
Rulers

Geo-solids

Sticky Dots

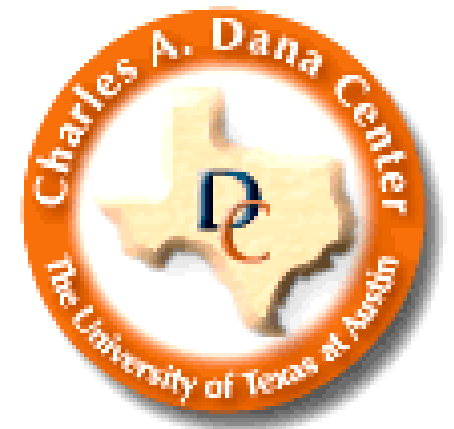
Centimeter and Inch Cubes

Calculator



Your task...

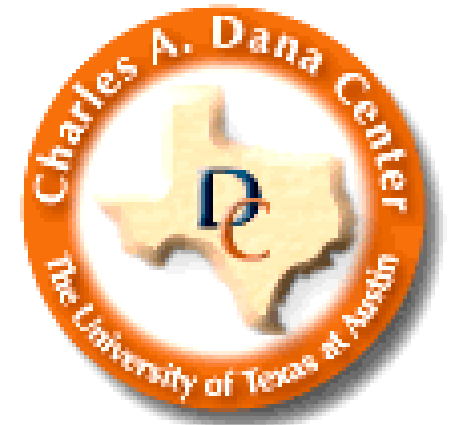
1. Brainstorm with your team members to create a list of all measurable attributes of a basketball. Include in your list the tools your team would use to measure these attributes.
2. Next, create another list of measurable attributes and tools for a single sheet of paper.



Compare-n-Share

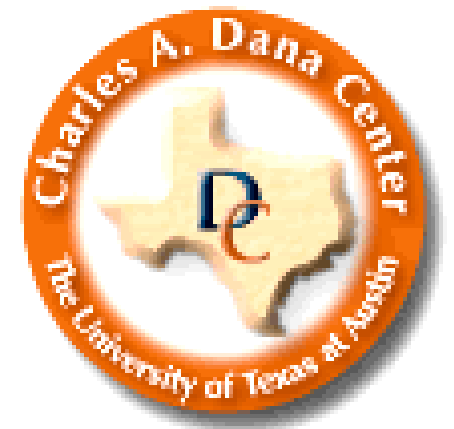
3. As a team, examine your two lists. Make a new list of similarities and differences between the measurable attributes of the basketball and a single sheet of paper.

Share your findings with the entire class.



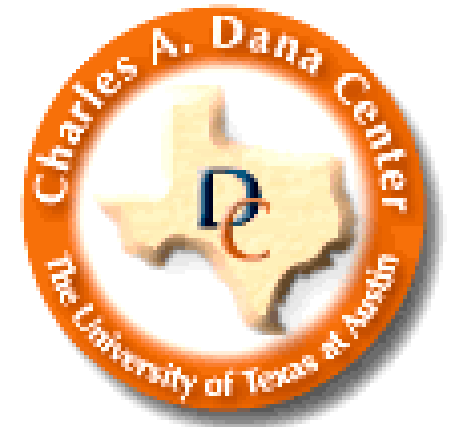
Investigating the Classroom

Complete #4 and #5 on your Student Recording Sheet



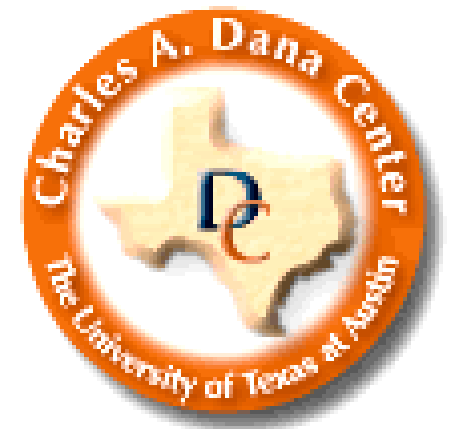
Exploring Dimensions

You have been examining the length, width, and height of several objects. If we want to talk about dimensions, how many dimensions have you been working with? How do you know?



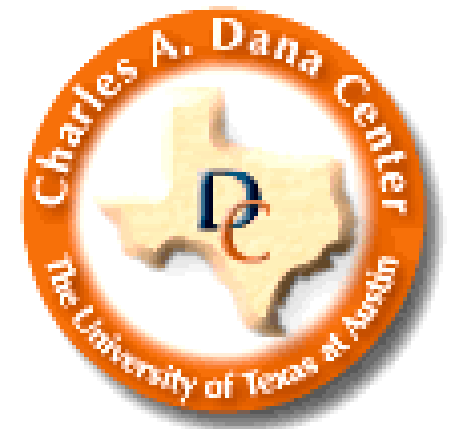
Exploring Dimensions

What we're going to do now is branch off into other dimensions. What are some other dimensions you know of? And, why would people want to know about these other dimensions?



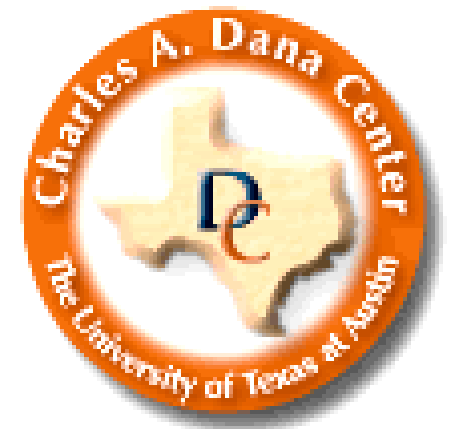
Exploring Units

- What units have you worked with so far?
- Can we use these same units when exploring the other dimensions?
- If so, what will change and what will stay the same?

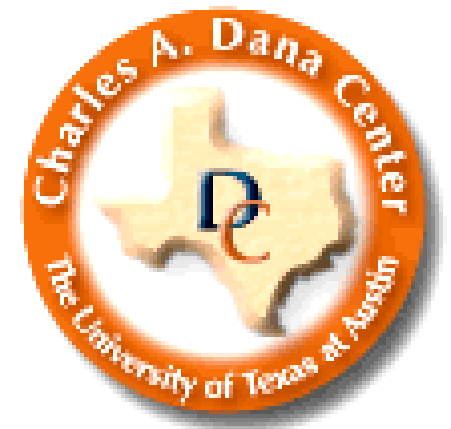
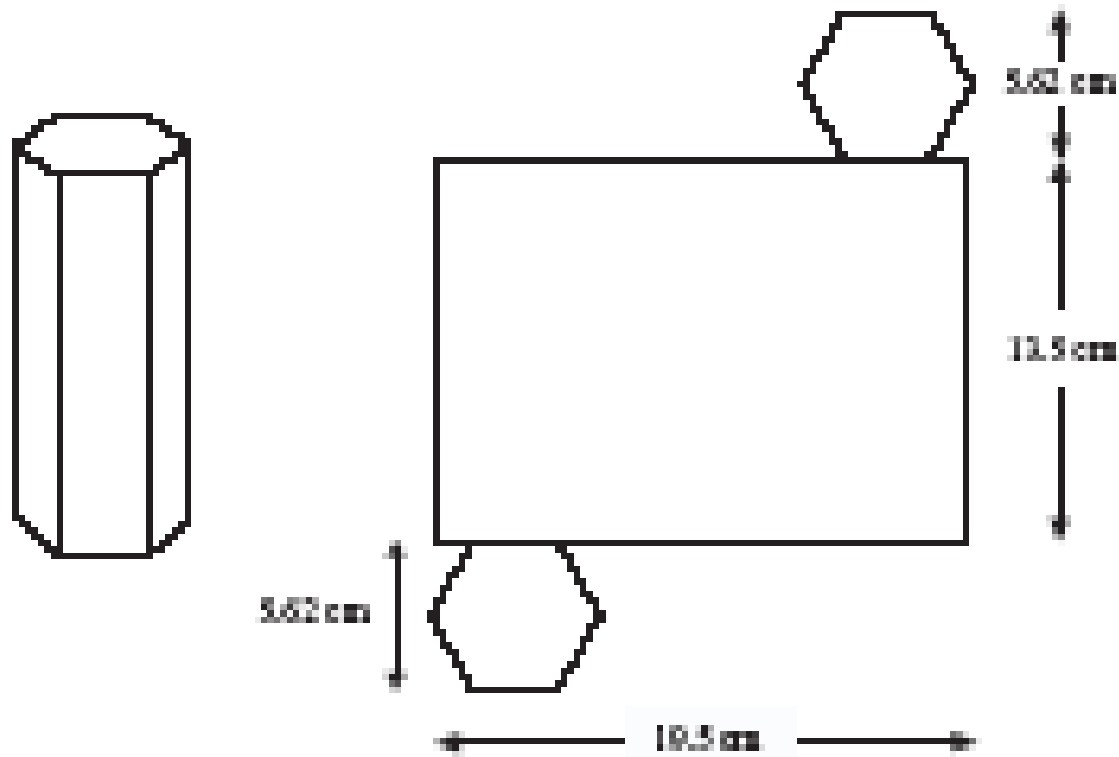


The Second Dimension...

Your team will now explore the surface area of your geo-solid. You will start with the solid and create its 'net' so you can examine your geo-solid's surface area.



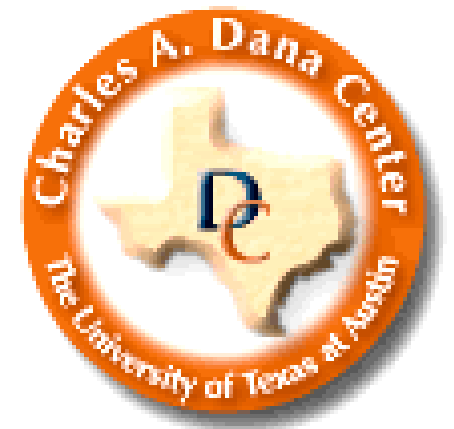
What are Nets?



Your task...

With your team, complete #6 and #7 on your Student Recording Sheet

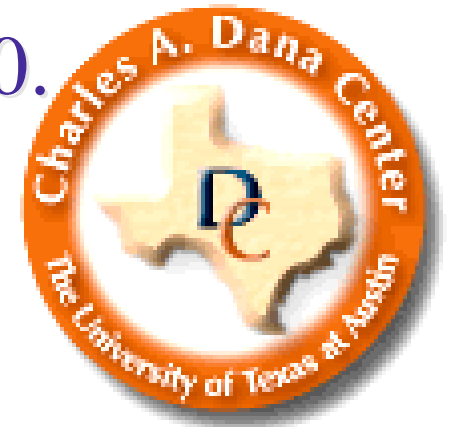
Share any important findings with the class.



Centimeters vs. Inches

Let's discuss the similarities and differences between these two units of measurement.

Your team will now discover the 'conversion ratio' between centimeters and inches AND develop formulas for calculating surface areas of certain geo-solids. Complete #8-#10.



Estimates vs. Formulas

Your team has estimated the surface area of several objects. Why are these ‘estimates’?

Your team will now apply the formulas you developed to see how closely your estimates match the results from your formula - what do you expect to find? Complete #11-#12.

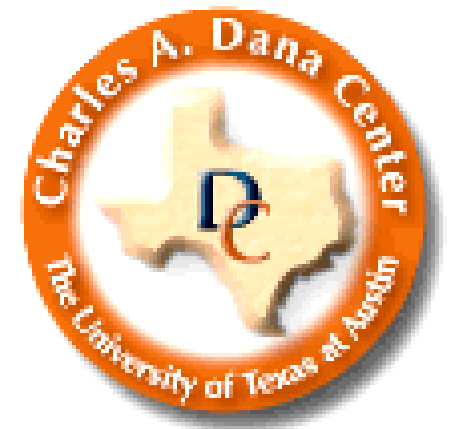
Share your findings with the class.



The Third Dimension...

Your team will now explore the volume of your geo-solid. You will do this by re-creating your geo-solid using the centimeter and then the inch cubes. You can do this because we already know the volume of these cubes. Complete #13-#15.

Share your findings with the class.



Estimates vs. Formulas

Your team has estimated the volume of your geo-solid. Why is this an ‘estimate’?

Your team will now develop a formula for the volume of your geo-solid to see how closely your estimates match the results from your formula - what do you expect to find?
Complete #16-#19.

Share your findings with the class.



Surface Area vs. Volume

Individually, describe the differences, as you see them, between surface area and volume.

Be prepared to share your findings with the class.

