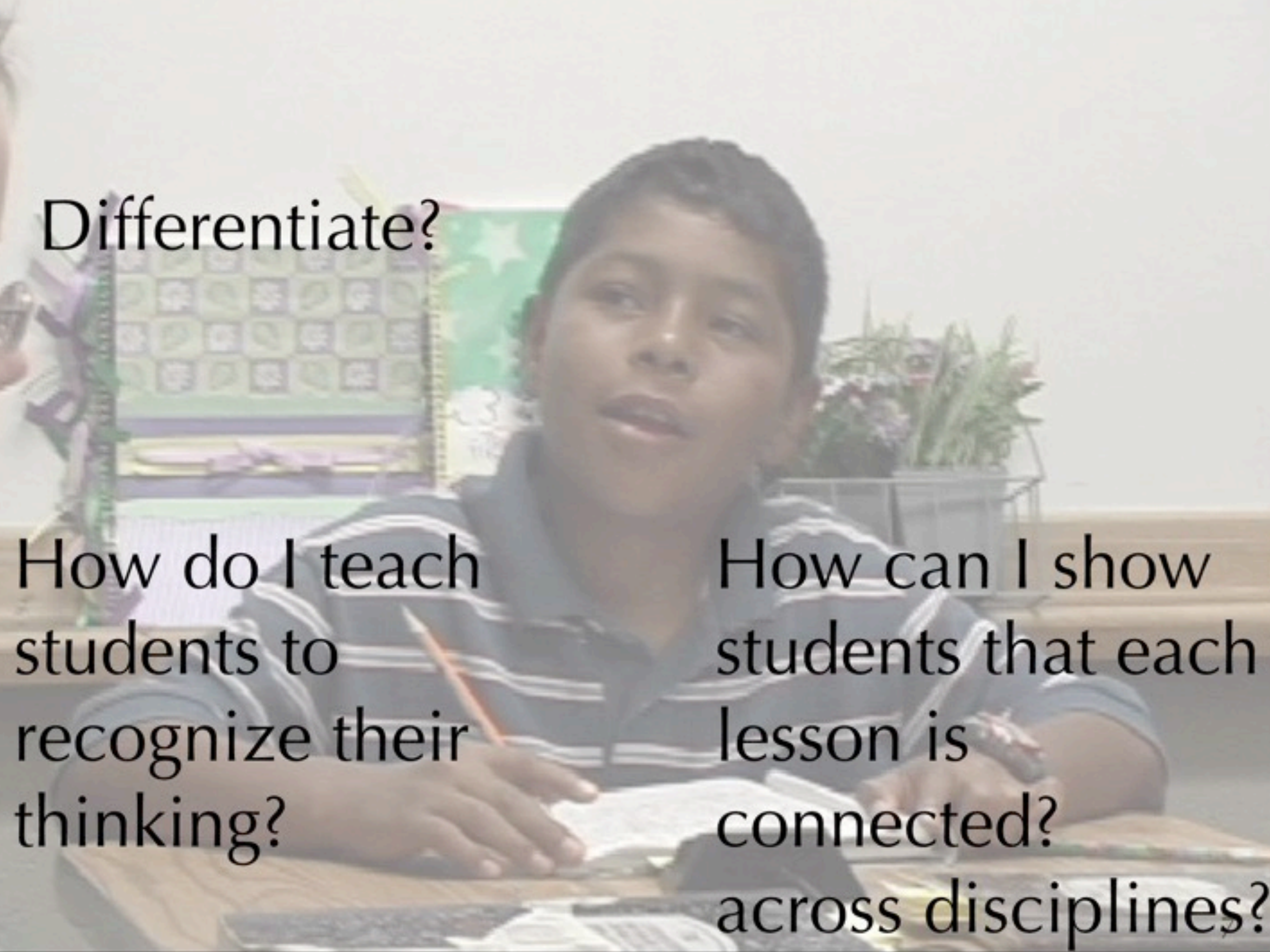


Teacher Try Daybooks First

Karen Haag

A young boy with dark skin and short dark hair is sitting at a wooden desk in a classroom. He is wearing a blue and white striped long-sleeved shirt. He is looking off to the side with a thoughtful expression. In the background, there is a green bulletin board with a grid of small pictures, a potted plant, and a window. The text "Differentiate?" is overlaid on the top left of the image.

Differentiate?

How do I teach
students to
recognize their
thinking?

How can I show
students that each
lesson is
connected?
across disciplines?



Figuring out what to do

Writing out the steps



Recording sheets

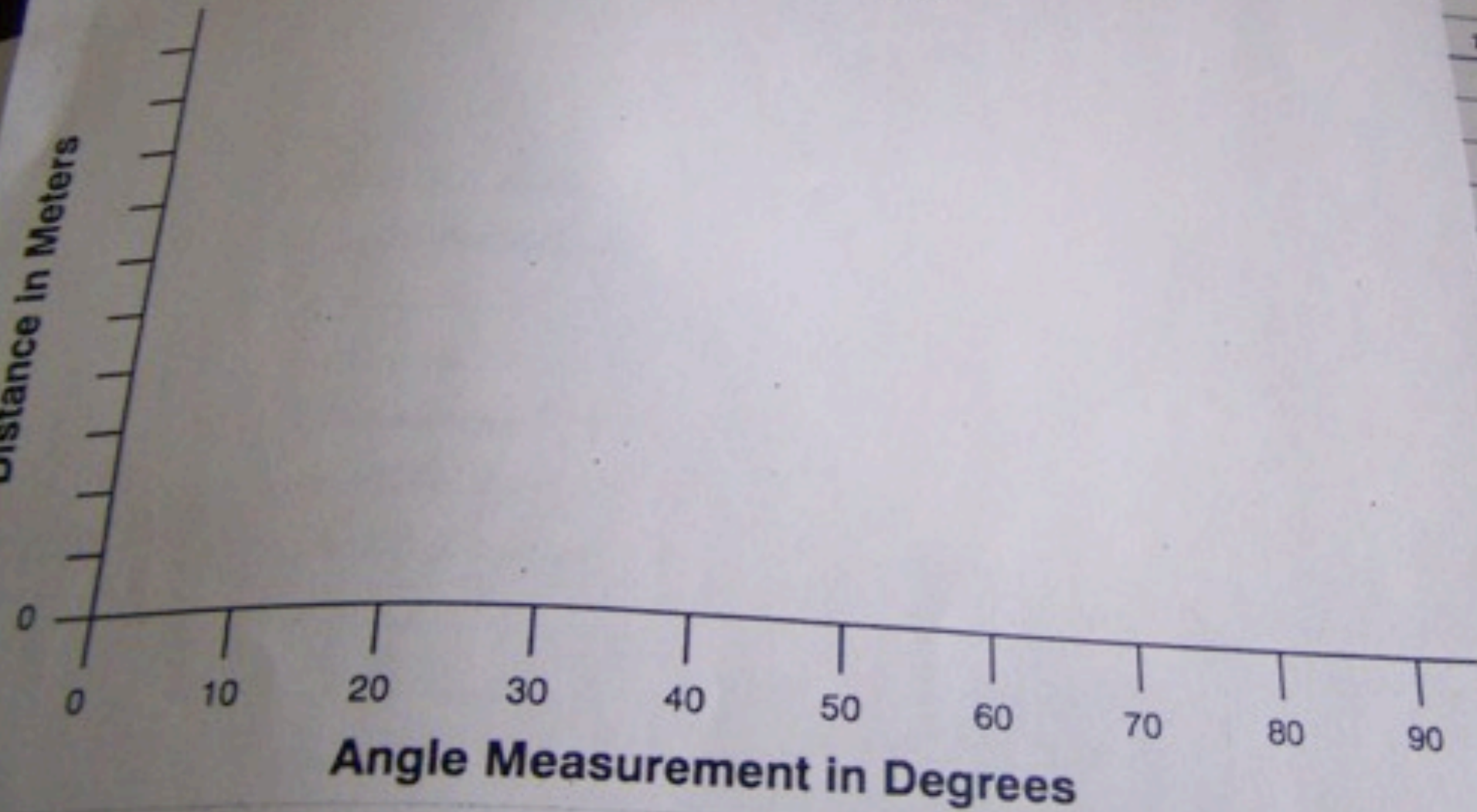


RUBBER BAND UNIT

Data Displays

Date _____ Team _____

Small Rubber Bands



RUBBER BAND UNIT

Data Collection

Team _____

Small Rubber Bands

1st Shot	Distance 2nd Shot	3rd Shot

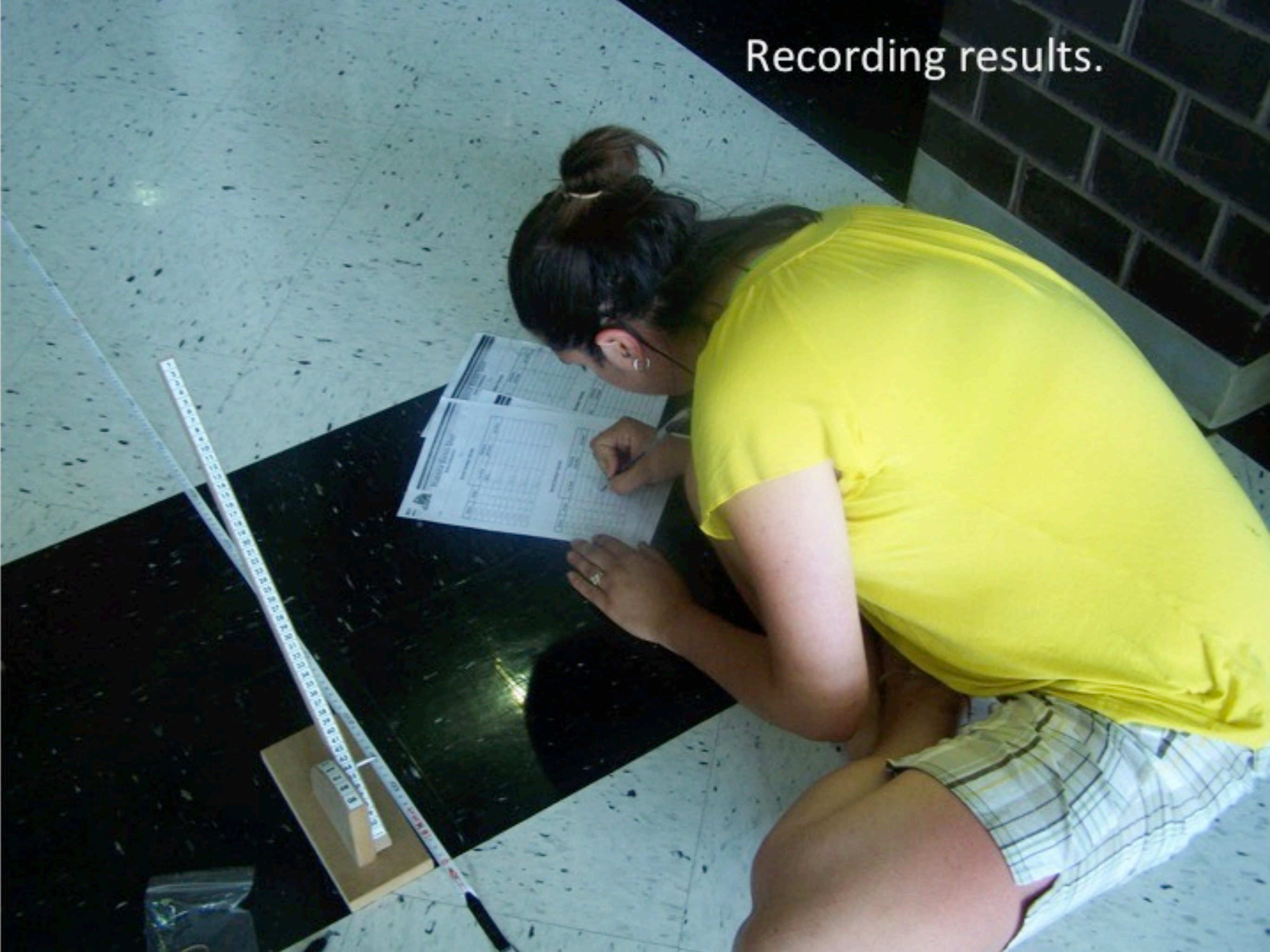
Rubber Bands

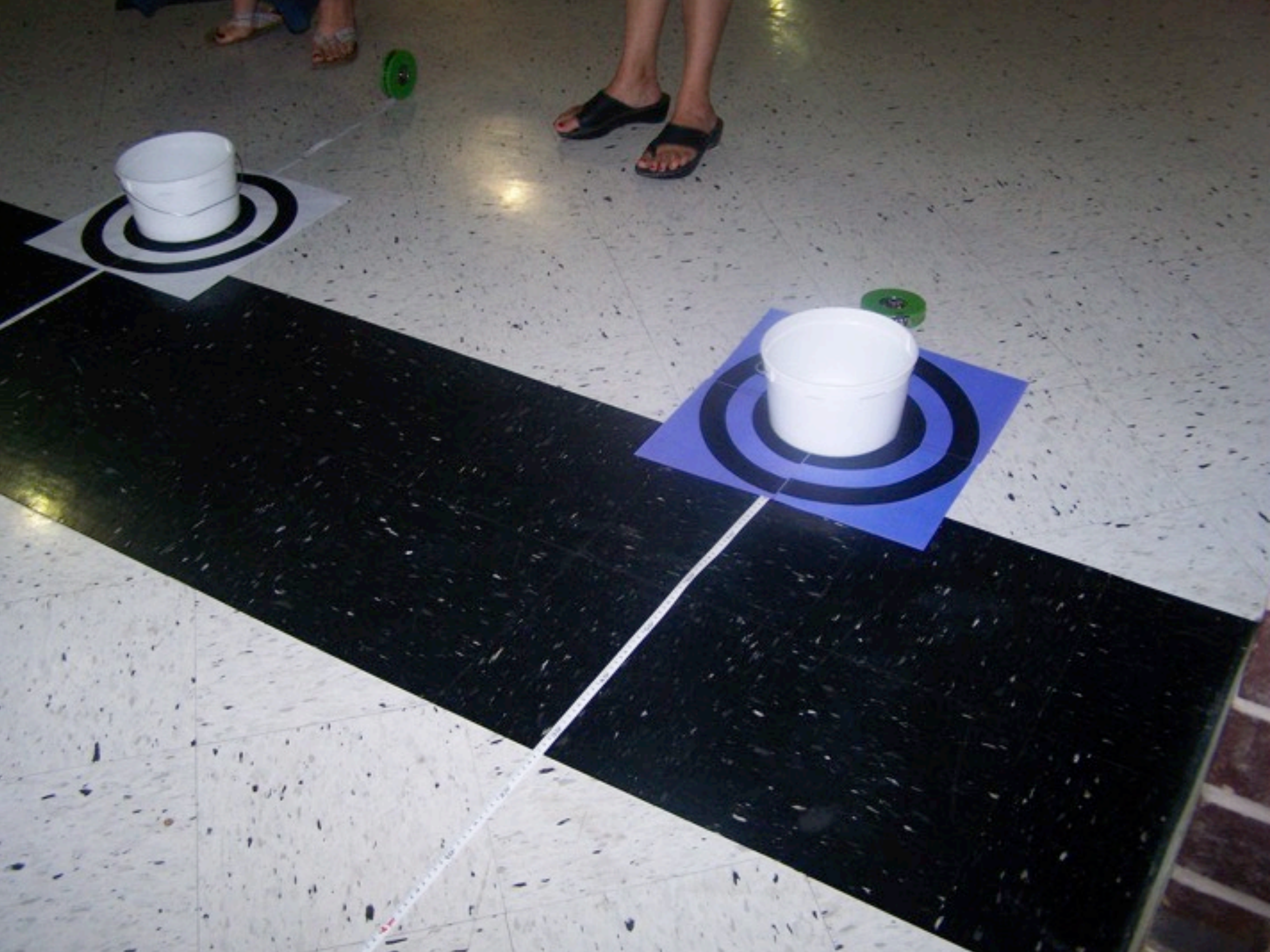
Distance 2nd Shot	3rd Shot



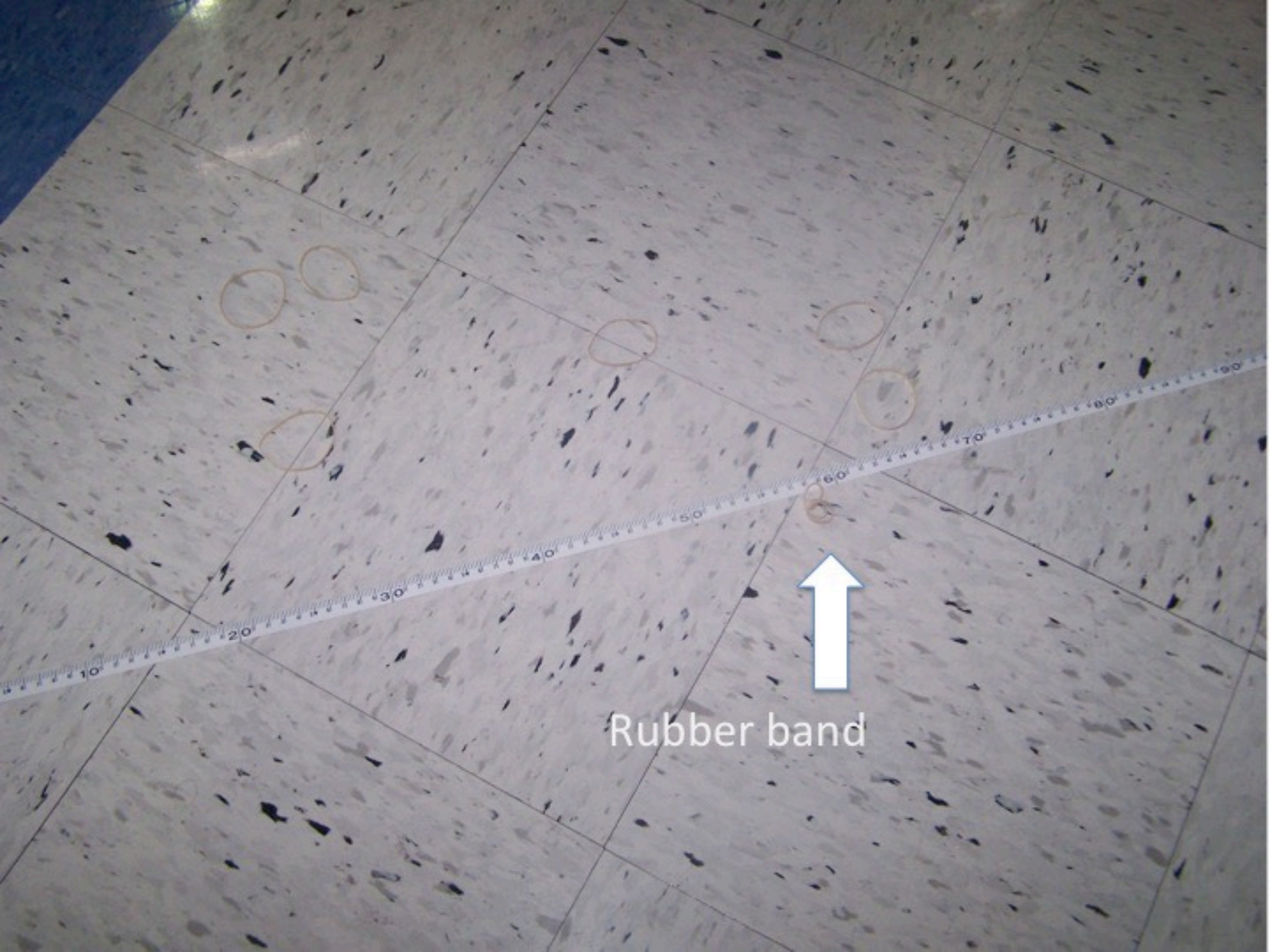
Go for it! Conduct the experiment.

Recording results.









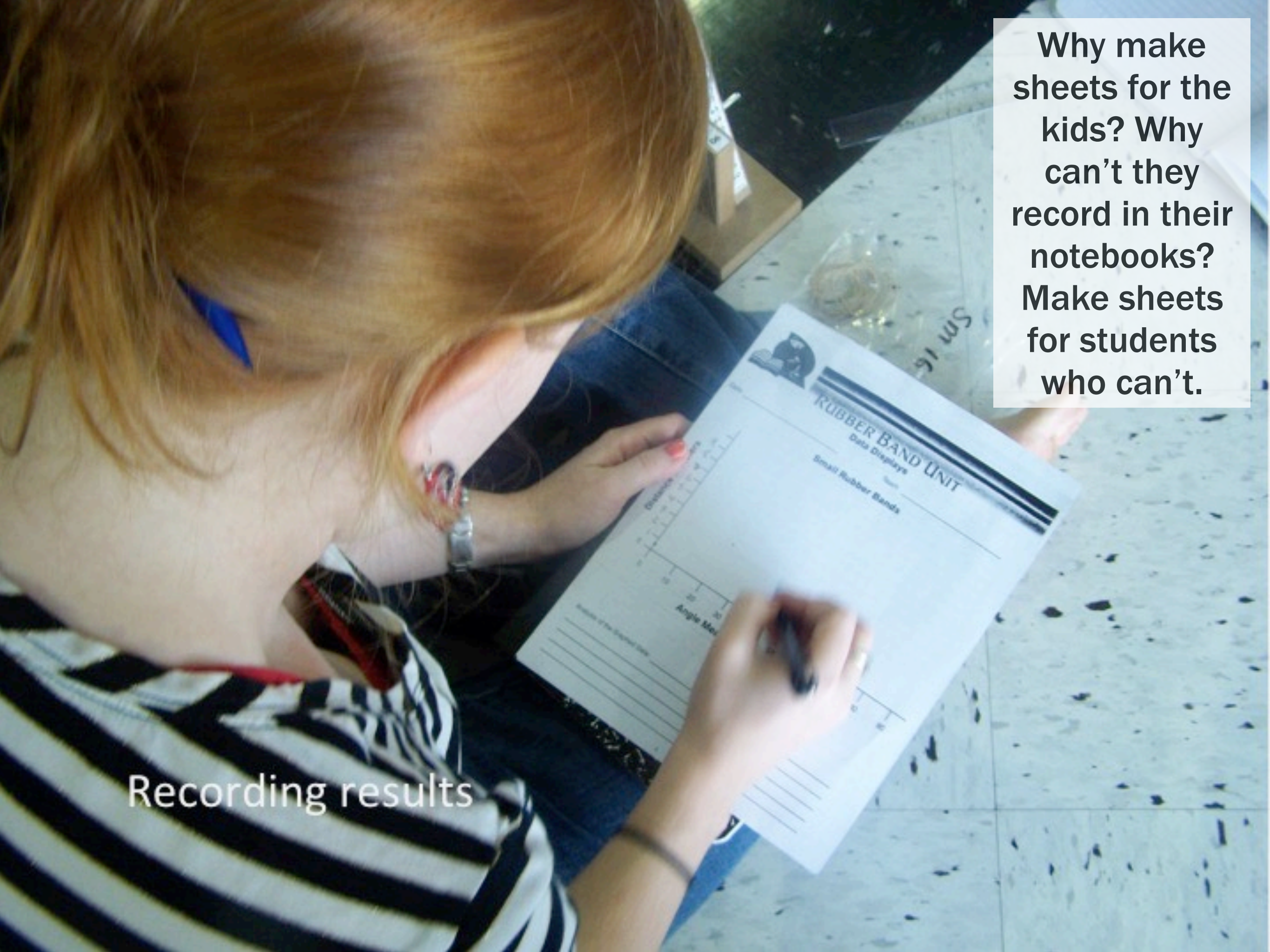
Rubber band



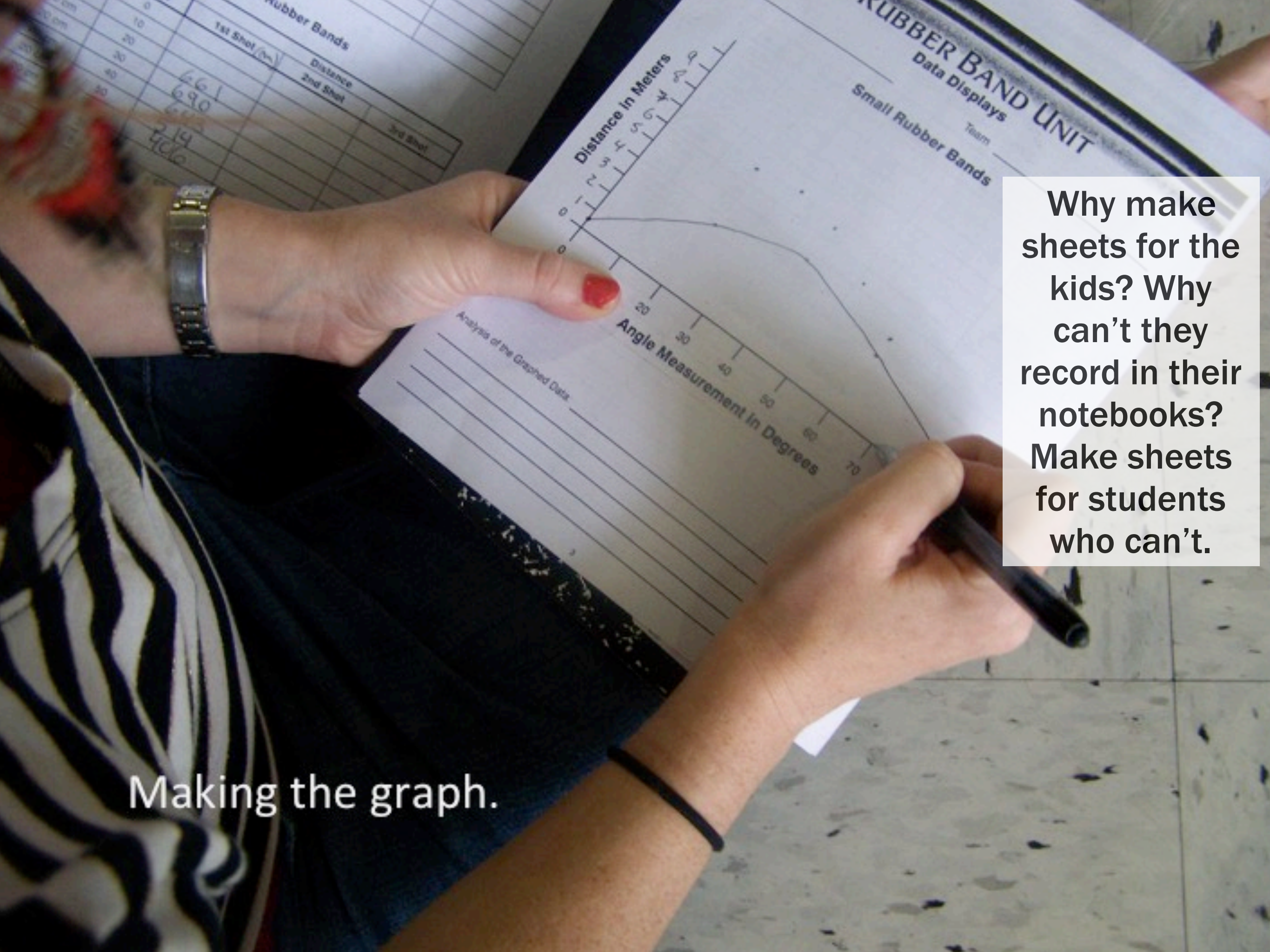
Several trials



Why make sheets for the kids? Why can't they record in their notebooks? Make sheets for students who can't.



Recording results



Why make sheets for the kids? Why can't they record in their notebooks? Make sheets for students who can't.

Making the graph.

Glue recording sheets
into notebook.

Procedure
Test shot 20s at various
angles and "pull" distance
and measure flight distance

Data see attached sheet
Analysis

Force	Angle	1st Shot	Distance
10 cm	0		2nd Shot
10 cm	10		55 cm
10 cm	20	34.2 cm	
10 cm	30	44.5 cm	
10 cm	40	30.6 cm	
10 cm	50	15.3 cm	
10 cm	60	2.14 cm	
10 cm	70	1.68	
10 cm	80		
10 cm	90		



Procedure
 Test shoot RBs at various
 angles and "pull" distance
 and measure flight distance
 from

Data see attached sheets!

Data

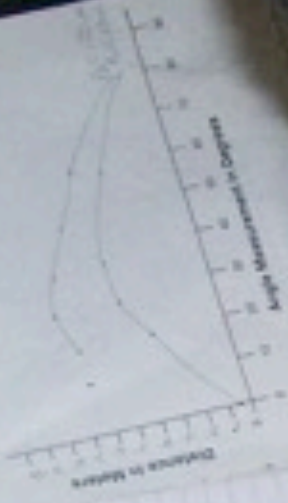


Time	Angle	Distance
10m	10	15.3m
10m	20	21.4m
10m	30	26.6m
10m	40	31.5m
10m	50	36.4m
10m	60	41.3m
10m	70	46.2m
10m	80	51.1m
10m	90	56.0m



RUBBER BAND UNIT

Small Rubber Bands



Small Rubber Bands

Length	Distance	Distance	Distance
cm	cm	cm	cm
0	0.00	0.00	0.00
10	0.05	0.05	0.05
20	0.10	0.10	0.10
30	0.15	0.15	0.15
40	0.20	0.20	0.20
50	0.25	0.25	0.25
60	0.30	0.30	0.30
70	0.35	0.35	0.35
80	0.40	0.40	0.40
90	0.45	0.45	0.45
100	0.50	0.50	0.50

Set up a Solar Cell

PROCEDURE

1. Work with your group to set up the solar cell. Use the diagrams at left as a guide.
2. Hold the solar cell so it directly faces the Sun, as shown in Position A below. Describe in your notebook what happens to the motor.
3. Gradually tilt the solar cell so that it still gets sunlight but does not directly face the Sun, as shown in Position B below. Describe in your notebook what happens to the speed of the motor.
4. Tilt the solar cell back to directly face the Sun. Keeping it directly facing the Sun, move it closer to and farther from the Sun. Describe what happens to the speed of the motor.

Figuring out what to do.



1. When you shined the flashlight on the solar cell, what happened to the motor?
2. When you tilted the solar cell from Position A to Position B, what effect did it have on the speed of the motor attached to the solar cell?
3. What does this tell you about the amount of the Sun's energy transferred to the solar cell in the two different positions? Be sure to give a complete explanation.
4. Why is the Northern Hemisphere warmer when it is tilted toward the Sun?
5. In Australia, it is summer in December and winter in July. Why is this?



Figuring out what to do.

Gathering supplies.

Explaining the Seasons

In last activity, you used a computer simulation to investigate there are seasons on Earth. Like any model, the simulation has strengths and weaknesses. But it doesn't show the correct relationship between the size of the Earth and Sun or the distance from the Sun. It also might give you the incorrect idea that Earth's tilt is the same in both hemispheres to be significantly nearer to the Sun. Let's take a look at the ways in which the tilt of Earth makes a difference.

CHALLENGE → Does the tilt of Earth lead to different surface temperatures?



Explaining the Seasons - Activity 77



PROCEDURE

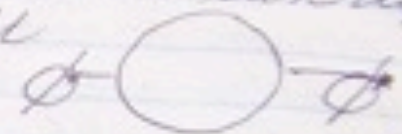
1. Work with your group to set up the solar cell as a guide.
2. Hold the solar cell so that it is directly facing the Sun. Describe what happens.
3. Gradually tilt the solar cell away from the Sun. Describe what happens.
4. Tilt the solar cell so that it is facing the Sun at an angle. Describe what happens.

Megan + Laurie
Middle School Notebooks

Question: How does the motion of the Earth affect us?

Lat Q (today): Why does the tilt of the Earth lead to different surface temperatures?

Answer: Because the Earth is closer or farther from the sun depending on the tilt.



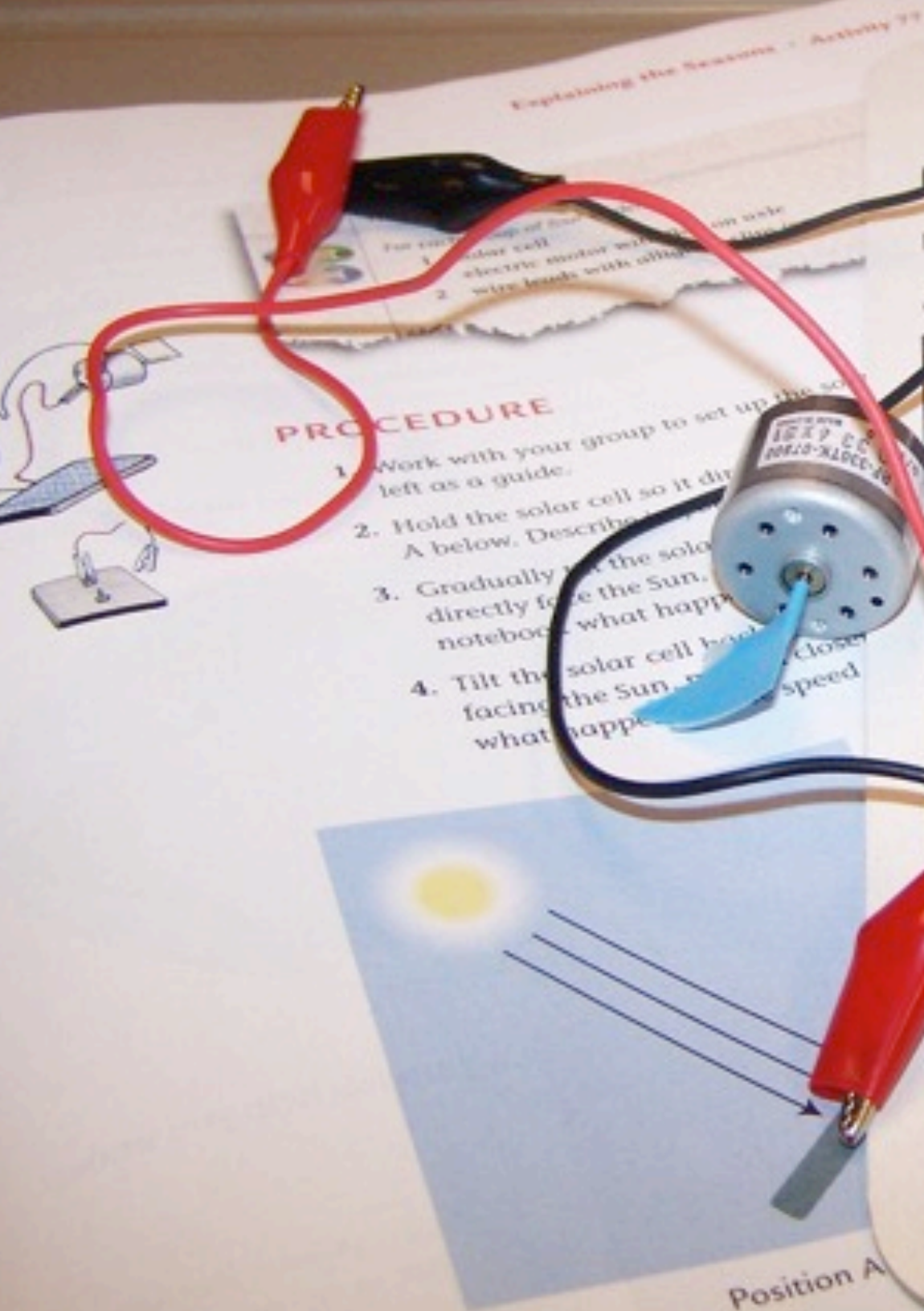
See F-33 or try or paraphrase

Data Table

Position	Trial 1 Flag Passes	Trial 2	Trial 3
A Direct to Sun			
B Tilted away			

Count flag passes in 30 seconds

Recording the steps.



Megan + Laurie
Middle School Notebook

Question: How does the motion of the Earth affect us?

Lab Q (today): Why does the Earth's surface temperature lead to different temperatures?

Because the Earth is closer or farther from the sun depends on the tilt of the Earth's axis.

Reflect back over 500 days

see F-33 or copy or paraphrase

Data Table

Position	Trial 1 Flag Passes	Trial 2
A Direct to Sun		
B Tilted away		

Count Flag Passes in 30 seconds

Megan + Laurie Middle School Notebooks

Reflect back over days
Question: How does the motion of the Earth affect us?

Lab Q (today): Why does the tilt of the Earth lead to different surface temperatures

Hypothesis) Predict: Because the Earth moves closer or farther away from the sun depending on the tilt



Procedure see F-33 or copy or paraphrase

Data Table

Position	Trial 1 Flag Passes	Trial 2	Trial 3	
A Direct to Sun				
B Tilted away				

Count flag passes in 30 seconds

Learning to use notebooks as scientists do while conducting the experiment.

Megan + Laurie Middle School Notebooks

~~Sum~~
~~52~~
~~165~~

Hardest
concept to
teach:
mistakes are
okay.

Reflect
back
over
sev. days

Question: How does the motion
of the Earth affect us?

Lab Q (today): Why does the
tilt of the Earth lead to
different surface temperatures

(Hypothesis) Predict: Because the Earth
moves closer or farther
away from the sun depending
on the tilt

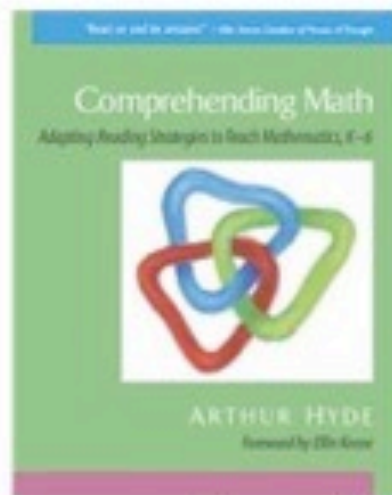


Analysis Ques 2-5

2. The motor slowed down when we tilted away from the sun.
3. When the motor is going faster, there is more energy transferred to the motor.
4. The N. Hemisphere is warmer when it's tilted toward the sun because it's closer and absorbing more energy.
5. ~~The~~ Australia is closer to the sun in December. Being that it is in the southern hemisphere, it is tilted toward the sun in Dec - opposite of Concord.

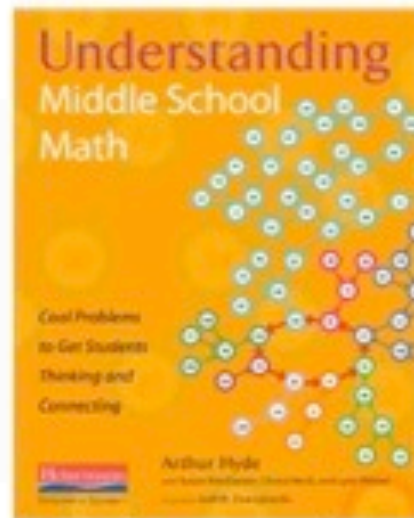
Analyze results.

...why is everything so difficult, so different from class to class?

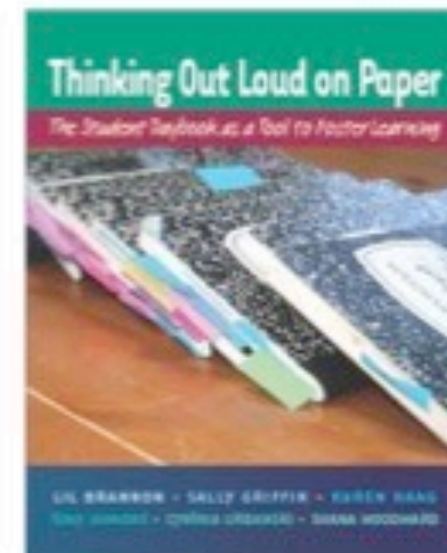


Comprehending
Math

Arthur Hyde



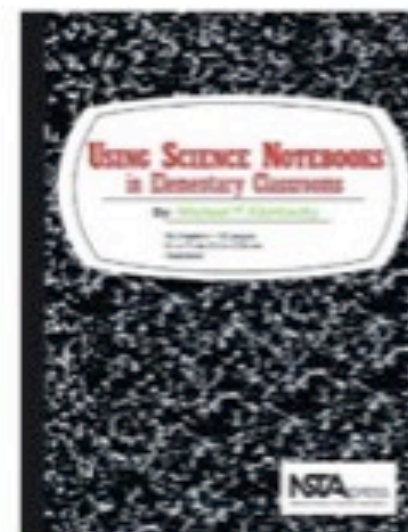
Understanding
Middle School
Math



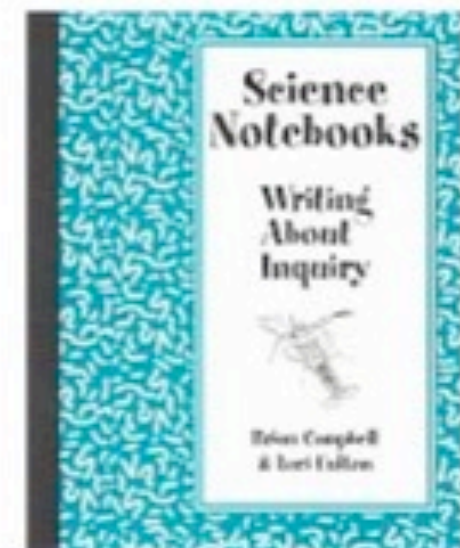
Thinking Out Loud on Paper



Notebook Know How and
Notebook Connections
Aimee Buckner



Using Science
Notebooks Michael
Klentschy



Science Notebooks
Brian Campbell