

Square or Rectangle

Overview

Square or Rectangle is an ongoing data collection activity that your kids can do throughout ClubZOOM. Kids compare their heights and arm spans to find out if they're squares or rectangles. You're a square if your arm span is about the same as your height (within 2 cm). You're a rectangle if your arm span and your height are different. From the data they collect, your kids can look for patterns between girls and boys, and among different age groups.

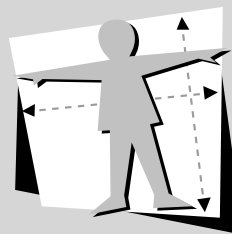
Science Scoop



As you grow, your body measurements change. Sometimes your height and arm span are the same (you're a square), and sometimes they're different (you're a rectangle). It's possible to be a square at one point in your life and a rectangle at another.

This activity starts with a simple question: Are there more squares or rectangles in the group? As you collect and display the data, other questions will come up: Are boys or girls more likely to be squares? As people get older, do they change from squares to rectangles or do they change from rectangles to squares? Are adults more likely to be squares or rectangles? You may also think of other questions. By analyzing the data you collect, you'll be able to answer some of these questions. Answers to other questions will have to wait until you've collected a very large data set.

There are lots of examples of people collecting data and figuring out what it means, such as the census, elections, and TV show ratings. In this activity, kids carry out all the steps of data collection: asking questions and making predictions, collecting data according to a specific plan, looking at displays of the data, and drawing conclusions that answer some questions and raise others.



Meeting 1: Introduce the activity and begin to collect data.

Meetings 2-5: Collect data from family and friends.

Meeting 6: Review the final data, look for patterns, and draw conclusions. Then send your results to ZOOM!



Set Up

- Set up a VCR and monitor to show the Square or Rectangle video segment (optional).
- Collect materials and make copies of the Square or Rectangle activity handout (see end of section).

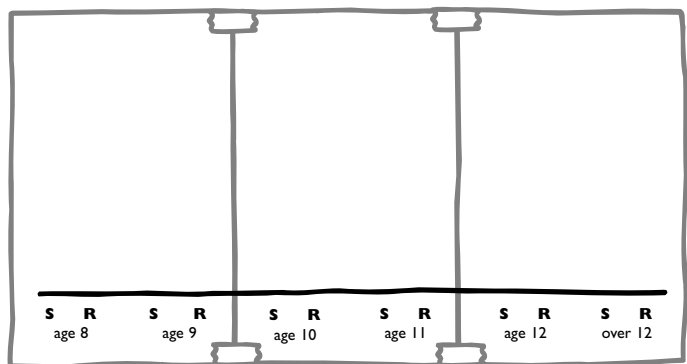


Materials		
<p>For Each ClubZOOMer</p> <ul style="list-style-type: none"> • one 1 1/2" x 2" Post-It™ note (yellow for boys; purple for girls) • Square or Rectangle handout 	<p>To Share</p> <ul style="list-style-type: none"> • several measuring tapes (metric) or meter sticks • pencils 	<p>For the Data Chart</p> <ul style="list-style-type: none"> • 3 sheets of 11" x 17" paper • clear tape • black marker • Predictions sign (see end of section) • Check It Out! sign (see end of section)

- Make the Data Chart:

1. Tape three sheets of 11" x 17" paper together.

2. Using a black marker, draw a horizontal line and label it as shown. Make sure you include labels for all of your kids' ages.



Key

S = square

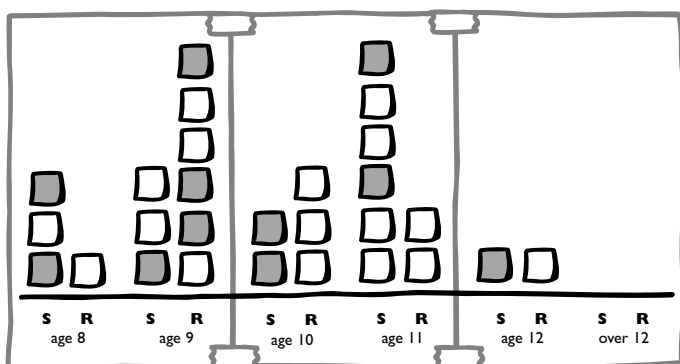
R = rectangle

3. Post the Data Chart in a central area so that ClubZOOMers can easily add data. Locating it on the ClubZOOM Board works well.
4. Attach a measuring tape or meter stick near the Data Chart.



Meeting 1: Introduce Square or Rectangle

1. Introduce the activity by asking the kids to guess whether they are squares or rectangles. You can also show the Square or Rectangle video segment to introduce the activity.
2. Explain that ZOOM wants to know if more people are squares or rectangles, and if a person's age or if a person is a girl or a boy makes a difference. Kids all across the country are measuring themselves, friends, and family members to help ZOOM find out. Your kids will collect data throughout the ClubZOOM meetings. As their pool of data grows, they'll look for patterns among girls, boys, and different age groups.
3. Before the kids start measuring, have them make predictions. Read each prediction from the Predictions sign, and record the number of ClubZOOMers who agree or disagree. Ask if the kids have any other predictions to add. (Some possible predictions: older girls are more often squares than rectangles, boys who are rectangles have a longer arm span than height.) Post the Predictions sign near the Data Chart.
4. Organize the kids into pairs and hand out the activity sheets and measuring tapes. Remind them to **take off their shoes** before they measure. Ask them why they think it's important to measure height without shoes.
5. After your kids record their measurements on their activity sheets, have them enter their data on the Data Chart. Explain that they should select a colored Post-It™ (purple for girls, yellow for boys) and write their initials on it. They should then find their age group on the Data Chart and stick the Post-It™ in the appropriate column.



Activity Tips

- Keep in mind that during the elementary and middle school years, kids grow at different rates and can be sensitive about their heights, especially if they are different from others. Be mindful of the effect this activity might have on kids who are taller or shorter than the rest of the group.
- Before the kids begin, you might want to demonstrate how to measure and record data. Ask for a volunteer whom you can measure. Then demonstrate how to record the volunteer's initials on the appropriate colored Post-It™ and place it on the Data Chart.
- Younger kids who are taller than one meter stick may need help measuring each other.
- Have extra Square or Rectangle Handouts, Post-Its™, and measuring tapes available to encourage the kids to collect data over the course of ClubZOOM. They can add data from friends, classmates, and family members.
- During each ClubZOOM meeting, you can use the Square or Rectangle activity as a "filler" for kids who finish their work early. They can take measurements of new people or look for patterns in the data that's been collected so far.
- You may need to use tape to secure the Post-It™ notes over the duration of the club. You can also use pieces of paper instead of Post-It™ notes.

Meetings 2–5: Measure and Record Data

1. Encourage your kids to keep collecting data during their free time, at home, and in school. You can provide extra copies of the Square or Rectangle handouts for the kids to take home so they can measure family members and friends.
2. Post the Check It Out! sign (see end of section) next to the Data Chart. At some point during each meeting, ask the kids to think about the data that's been collected so far by answering questions on the sign.

Meeting 6: Review Data and Draw Conclusions

1. Have the group review the final data.
 - **What conclusions can you draw about the number of people who are squares and the number who are rectangles?**
 - **What new questions do you have?**

You can also use questions from the Check It Out! sign to guide the discussion.

2. Remind your kids of the predictions they made at the beginning of the activity.
 - **How do your predictions compare to the final data?**
 - **What's most surprising?**
 - **Why do you think some results are different from your predictions?**

(Note: Remind the kids that it's okay if their predictions do not match the final results. Scientists make predictions all the time, and they sometimes learn more when they're wrong than when they're right. When you make a prediction, you explain in advance what you think will happen based on current evidence or past experience. A prediction may turn out to be false, but you'll still learn information that will help guide the next steps in an investigation.)



ZOOM Links

Visit the Zoom Web site and continue **collecting and analyzing data**:

Backpack Survey

pbskids.org/zoom/backpack

Are backpacks heavier on certain days of the week? Weigh in here.

Flu Survey

pbskids.org/zoom/survey/flu_index.html

Get the scoop on the flu—who gets it, where, and when.

Pet Survey

pbskids.org/zoom/survey

How many different kinds of pets do people have?

Square or Rectangle

pbskids.org/zoom/sci/squares-rectangles.html

Add your data to the national database.

Streetlight Survey

pbskids.org/zoom/survey

Keep track of what time the streetlights turn on in your neighborhood.

Tongue Rollers

pbskids.org/zoom/sci/tonguerollers.shtml

Collect data on people who can roll tongues.

Tooth Decay

pbskids.org/zoom/sci/toothdecay.shtml

Find out who has more fillings—girls or boys.

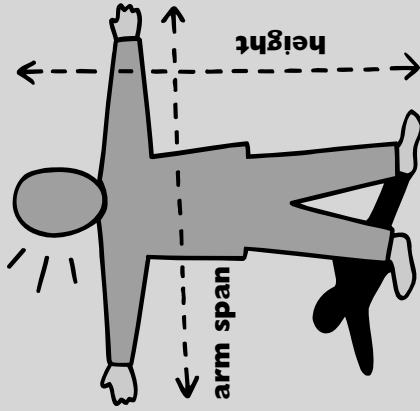
Are you a

Square or a

Rectangle?

What You Need

- meter stick or measuring tape



- 1 **Take off** your shoes.
- 2 Have a partner **measure** your **height** (the distance from your head to your feet) in centimeters.
- 3 Then **measure** your **arm span** (the distance from the longest finger on your left hand to the longest finger on your right hand) in centimeters.
- 4 If your height and arm span are about the same (within 2 cm), you're a **square**. If they're different, you're a **rectangle**.

Data Chart

Initials	Age	Girl	Boy	Height	Arm Span	Square	Rectangle
_____	_____	<input type="radio"/>	<input type="radio"/>	_____ cm	_____ cm	<input type="radio"/>	<input type="radio"/>
_____	_____	<input type="radio"/>	<input type="radio"/>	_____ cm	_____ cm	<input type="radio"/>	<input type="radio"/>
_____	_____	<input type="radio"/>	<input type="radio"/>	_____ cm	_____ cm	<input type="radio"/>	<input type="radio"/>
_____	_____	<input type="radio"/>	<input type="radio"/>	_____ cm	_____ cm	<input type="radio"/>	<input type="radio"/>



Sent in by Andee R. of Boulder, CO

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Measure your friends and family members. Are more **girls** squares or rectangles? How about **boys**? What patterns do you notice among different **ages**?

Analyze your data and see what **conclusions** you can make. Be sure to visit the ZOOM Web site to see data collected by kids from across the country.

Try It Out!



pbskids.org/zoom

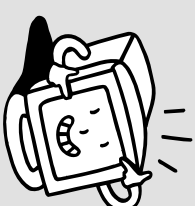
Send your ideas to ZOOM!

Dear ZOOM,

Here's what I discovered from my data:



Write or draw here.



Send an e-mail:
pbskids.org/zoom/sendit

Then instantly print out a copy of ZOOMerang—a news-letter-filled with cast trivia and lots of fun ZOOM activities.



Or, send a letter:
ZOOM
Box 350
Boston, MA 02134

Don't forget to include your name and return address so we can send you a copy of ZOOMerang.

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Record the number of ClubZOOMers who agree or disagree with each prediction.

Number that disagree

Number that agree

I predict that more people are squares than are rectangles.

I predict that girls are more likely to be squares than are boys.

I predict that younger people are more likely to be squares than are adults.

I predict that _____.

I predict that _____.

I predict that _____.



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Check It Out!

Square or Rectangle

- Are there **more** squares or rectangles overall?
- For your **age group**, are more people squares or rectangles?
- Are more girls than boys **rectangles**?
- Are more girls than boys **squares**?
- What **other patterns** do you notice?
- Did anything **change** since you last looked?



ZOOMon!

Keep collecting data and send your results to ZOOM. Be sure to visit the ZOOM Web site (pbskids.org/zoom/sci/squares-rectangles.html) to see data collected by kids from all over the country.

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