Design The Mascot with Pixels

For the next few days, you will be engaged in a role play in which you will design the MASCOT for a new primary school, the Q Primary School and learn mathematics.

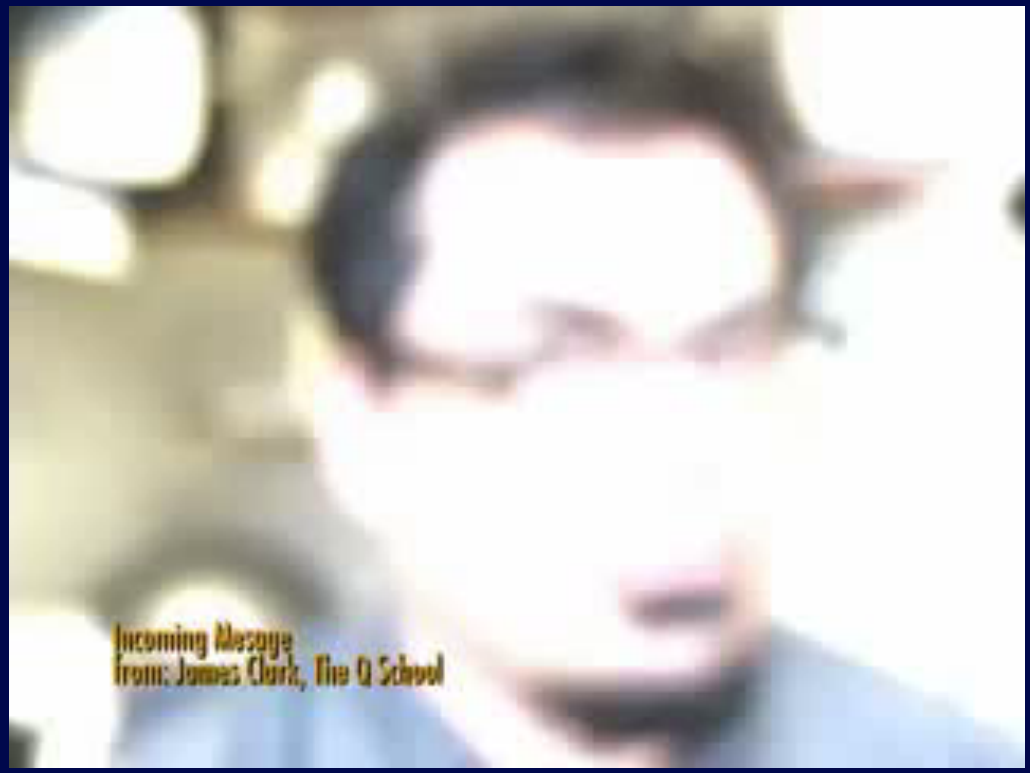
Pupils — you are taking the role of digital designers.

Teacher — you are their supervisor.

Future Home of The Q Primary School

Future Q Primary School Students

Client Message Part 1



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MY Q is a new handheld learning device for the pupils of the Q Primary School. Pupils are aged 5 - 7.

The MY Q's low resolution display will show the Q School's MASCOT.

Your job is to design the MASCOT.

Here's one we did. Clearly, we need your help!

We see and use digital images all the time — on computers, mobile phones, and game consoles.

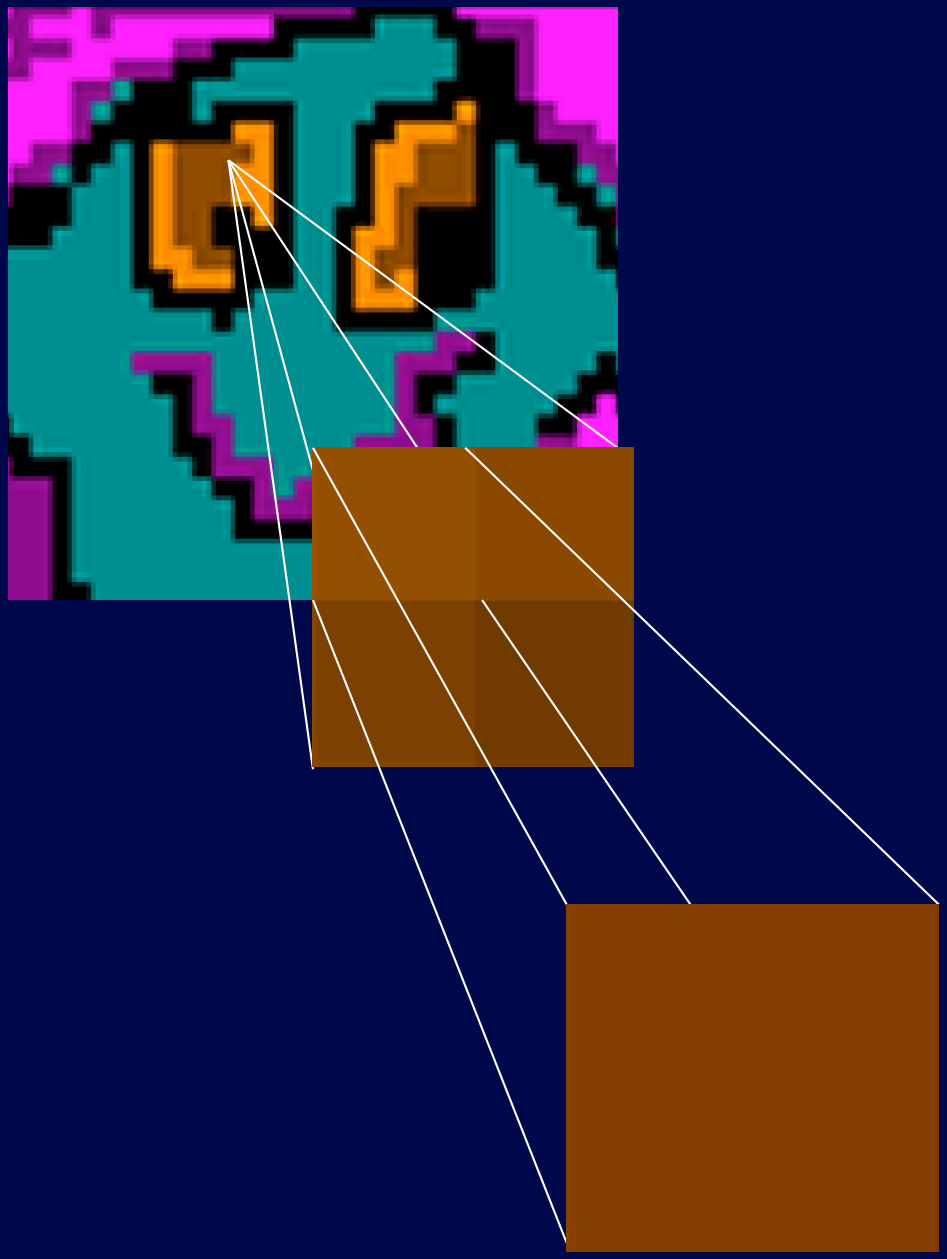
Just remember — somebody designed those images. For this project, that someone will be you!

Digital designers use mathematics.

They

- **Estimate.**
- **Think about properties of shapes.**
- **Provide precise instructions for the computer.**

How much screen space?
Can I maximize?
How fast should it move?



It all comes down to
PIXELS.

What's a pixel?

It is the smallest unit on a display.

It is like a "point" to "paint" with.

Original image: 3024 x 1998 pixels

“High resolution” means many pixels in a given space.

Original image: 50 x 33 pixels

“Low resolution” means fewer pixels in the same size space.

In the next few lessons, you will

- Design to specific criteria
- Make sketches and estimate area
- Create a final Q School MASCOT with DigiTool
- Re-size the MASCOT for new displays and media
- Investigate the mathematics of re-sizing.

Design Criteria

Your Q School MASCOT design must

- Appeal to the Q School's 5 - 7 year old pupils.
- Cover at least 60% of the display area.

Your Design Criteria

- Imagine a particular child.
- What would make a MASCOT look appealing to that child?

✓ ***List 3 criteria.***

Rapid Sketching

- ✓ Make 2 sketches of mascots.

  Be creative but…

  keep the design criteria in mind.

- ✓ Estimate how much of the display area is occupied by each MASCOT .
- ✓ Explain how each MASCOT design satisfies (or doesn't) the criteria.

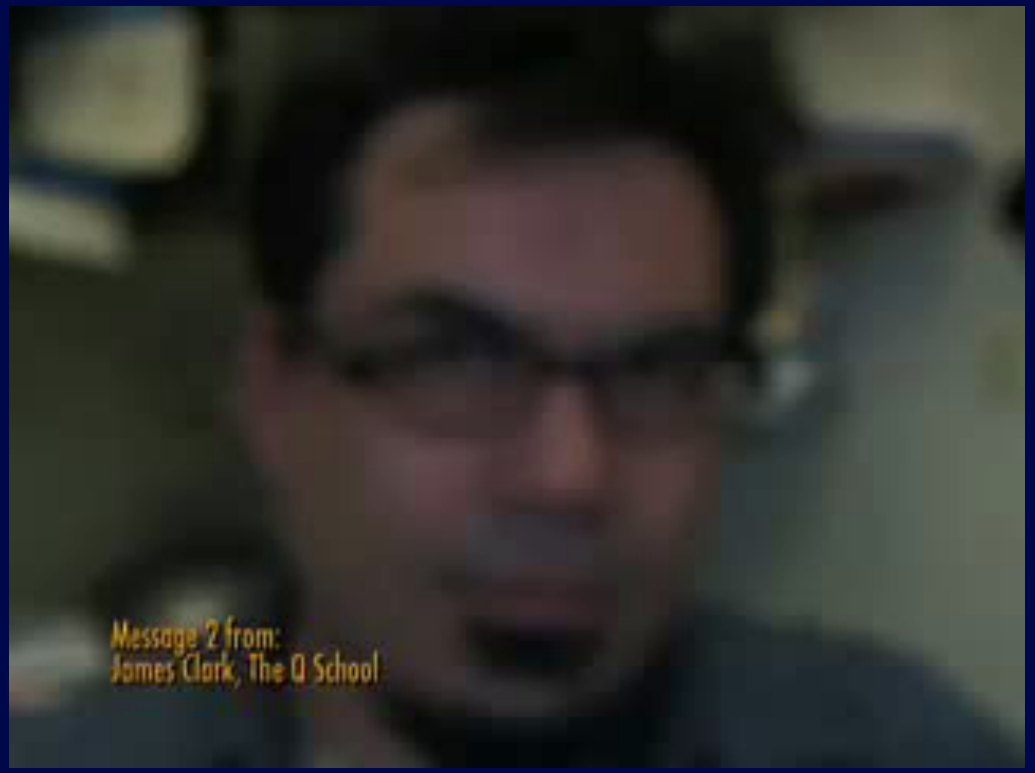
Finalize Your Design

- ✓ Use the DigiTool to make a pixel-by-pixel final design.
  - Use your sketches to guide you.
- ✓ Explain how your design meets each of the criteria.

Discuss the Maths

- How did you estimate the area covered by your MASCOT ?
- What makes a good MASCOT design?

Client Message Part 2



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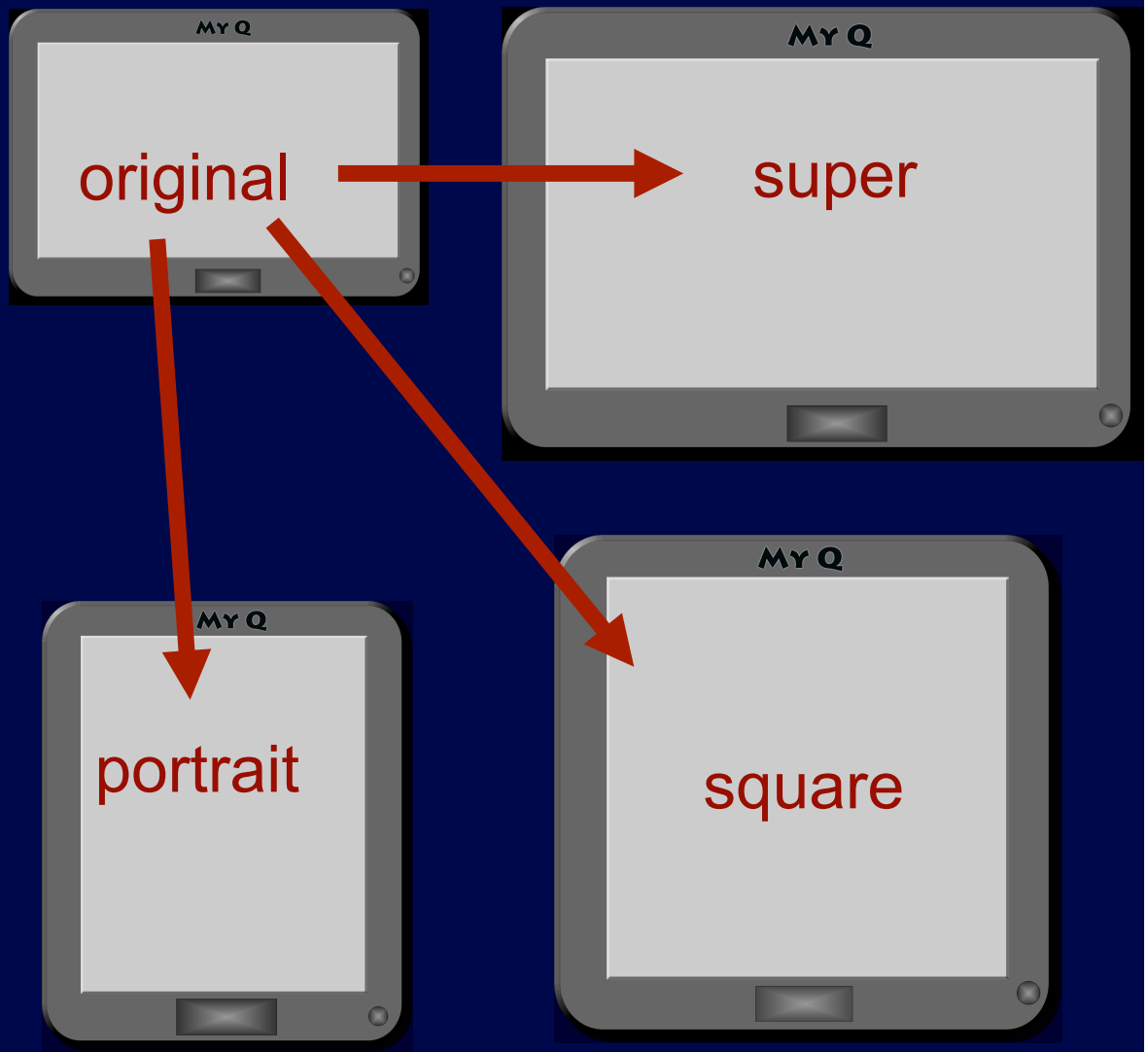
Part 2

New Devices, Different Size Displays

Three new **MY Q** devices will use different size displays.

Your job is to investigate how the new display sizes will affect your **MASCOT** design.



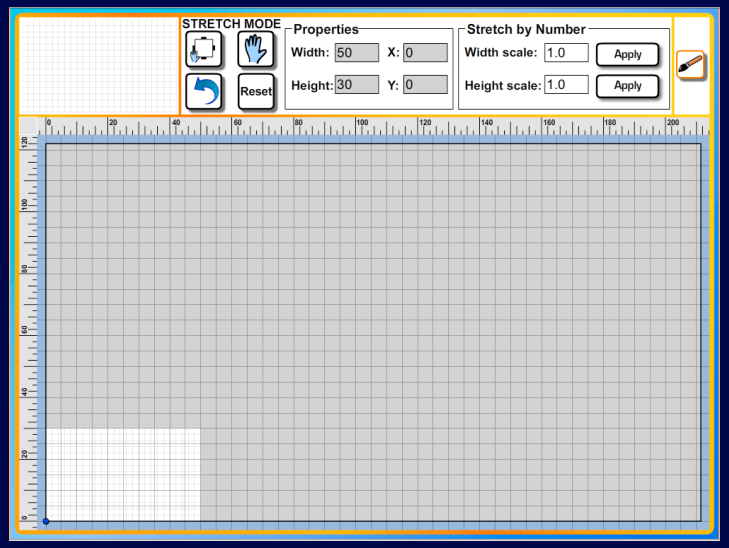
New Devices, Different Size Displays

- ✓ **Predict the new sizes and fill in the table.**
  - – Don't forget to use the specified width to height ratios and meet the pixel requirements

Part 2

Resizing Your Mascot

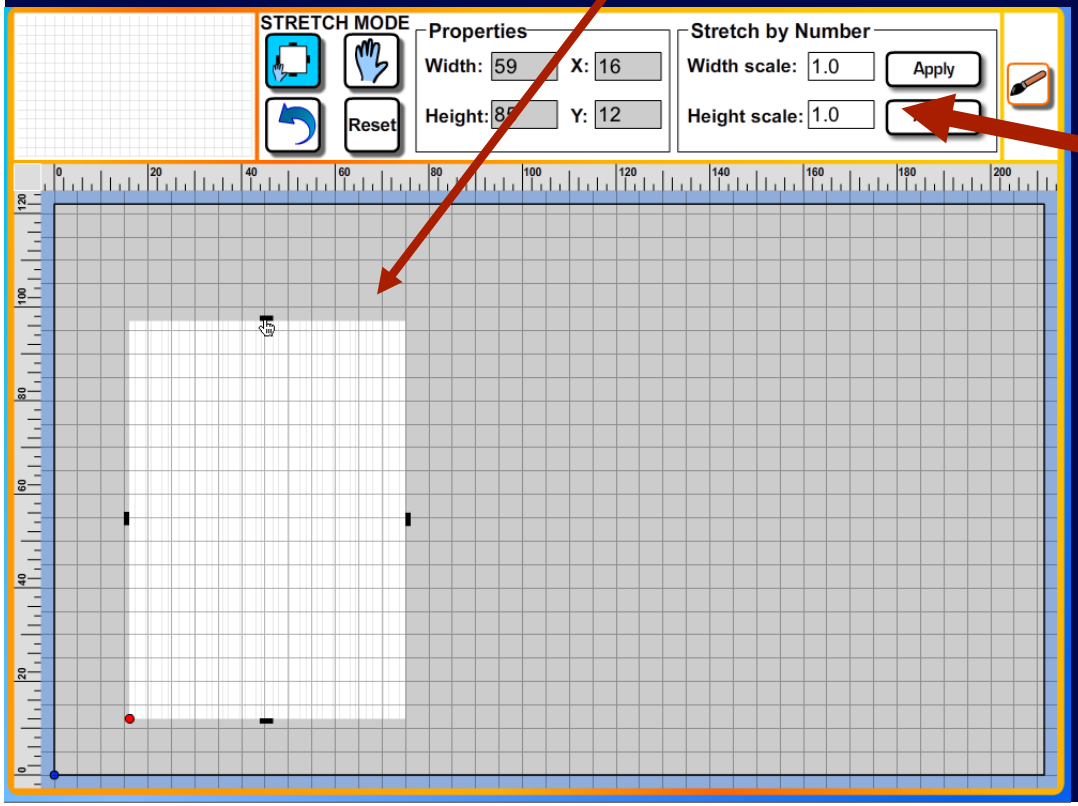
- ✓ For each new display, use the DigiTool, in Stretch Mode. Resize your shape in two ways. Check your table predictions, and revise as necessary.



Part 2

Resizing: Two Ways

Use the Stretch Frame tool. It lets you stretch the image by clicking and dragging the hot spots.



Use the Stretch by Number tool.
Resize the image by setting and applying width and height scales.

Discuss the Maths

- How did you decide on the width and height for the SQUARE MY Q?
- How did you use numbers to resize the display for the SUPER MY Q?
- How did you use numbers to resize the display for the PORTRAIT MY Q?
- Which new display will be the best for displaying your MASCOT?

Many Super My Qs

let's collect the design teams' dimensions for the Super My Qs here

Name	Width	Height	Width Scale	Height Scale	Total Pixels
original	50	30	1	1	1500

Discuss the Maths

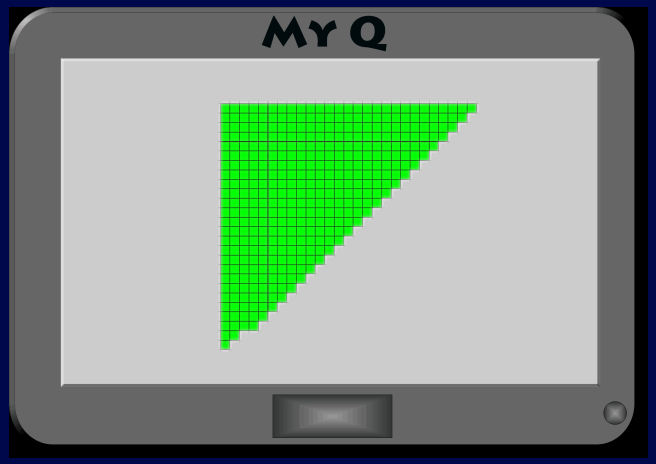
- Find as many relationships as you can among width, height, and scale factors of the SUPER MY Qs.
- What is the relationship between the width, height and number of pixels for each row in the table?
- How do scale factors for width and length affect the number of pixels needed for each SUPER MY Q?

Client Message Part 3

Design THE MASCOT with Pixels

Circles and Triangles
Do They Meet the Criteria?

- The Q School's steering committee wants to investigate making the MASCOT designs simple geometric shapes like circles and triangles.
- Would designs of circles or triangles meet the design criteria?



Sizing Up a Circle

- ✓What is the approximate area, in pixels, of the largest circle that can fit the original MY Q screen?
- ✓If your MASCOT were shaped as a circle, would it cover at least 60% of the MY Q screen?

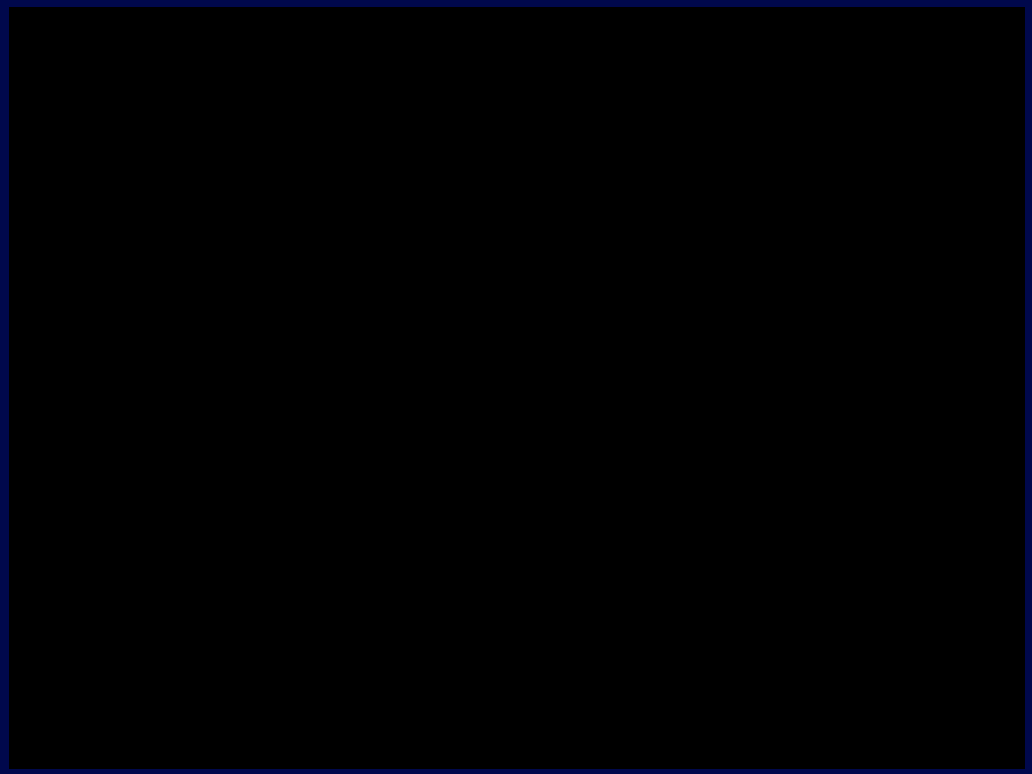
Sizing Up a Triangles

- ✓What is the approximate area, in pixels, of the largest triangle that can fit the original MY Q screen?
- ✓If your MASCOT were shaped as a triangle, would it cover at least 60% of the MY Q screen?

Discuss the Maths

- How did you decide on the diameter for the largest circle that could fit in the original My Q screen?
- How did you calculate what percentage of the screen that the largest circle would cover?
- How did you decide on the diameter for the largest triangle that could fit in the original My Q screen?
- How did you calculate what percentage of the screen that the largest triangle would cover?
- What are your recommendations to the client?

Client Message Part 4



Part 4

T-shirts, Coffee Mugs, What's Next
More Displays

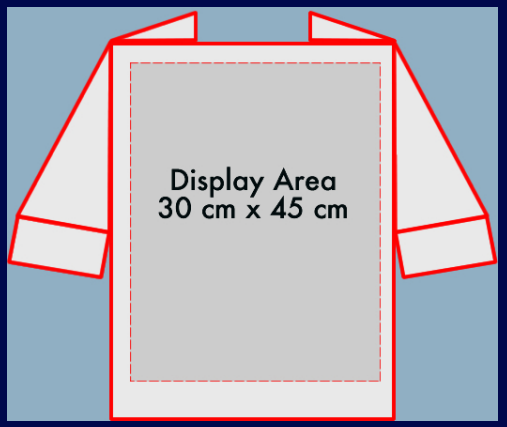
The Q School's steering committee wants the MASCOT on many different items.

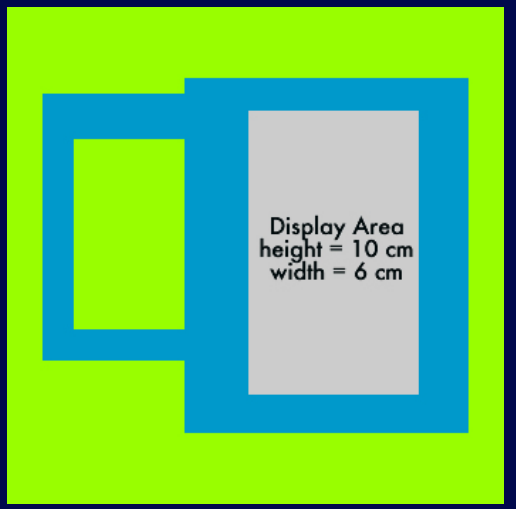
How will you change your design?

Part 4

Resizing Your Mascot

- ✓ For each new format, use the DigiTool, in Stretch Mode. Resize your shape as necessary.
- ✓ Explain how your Mascot design would need to change to meet the design criteria for each object.





Discuss the Maths

- How did you decide on the width and height for your MASCOT for display on a t-shirt?
- How did you decide on the width and height for your MASCOT for display on a coffee mug?
- What would your process be for investigating the redesigns necessary for displaying your MASCOT on other kinds of objects?

Thank you for your hard work.

How will you use the maths you have just learned not only in school but in the rest of your life?

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