**What Floats Your Boat – Practical 7 Photo/Video Story**

Name and Advisory: ..................................

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| AUSTRALIAN CURRICULUM CONTENT DESCRIPTORS |
| **Maths** |
| Solve problems involving the surface area and [volume](http://v7-5.australiancurriculum.edu.au/glossary/popup?a=M&t=Volume) of right prisms [(ACMMG218)](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMMG218) |
| Calculate the areas of composite shapes[(ACMMG216)](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMMG216) |
| Solve problems using [ratio](http://v7-5.australiancurriculum.edu.au/glossary/popup?a=M&t=Ratio) and scale factors in [similar](http://v7-5.australiancurriculum.edu.au/glossary/popup?a=M&t=Similar) figures [(ACMMG221)](http://v7-5.australiancurriculum.edu.au/curriculum/contentdescription/ACMMG221) |

**The Task:**

1. Use video or a photo story to recreate an ***accurate*** representation of this practical.
2. Record the practical including vision of your boat floating with your human models.
3. Submit a ***photo or video report*** showing all the mathematical calculations and science concepts your group used to solve this problem.

**Equipment:**

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| Cardboard | Plasticine | Sticky Tape |
| Scissors | Electronic scales |  |
| Bathroom scales | Calculator |  |

**Method:**

**Part 1**

1. Show all your working.
2. Estimate or weigh the members of your team ***in grams.*** (e.g. 50kg = 50,000g)
3. Record the total weight of your team.

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1. Draw a 1:10 model of the shape above onto cardboard. (hint: 200cm = 20cm) (Keep for Part 3)
2. Calculate the area of your shape.

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**Part 2**

**Calculations: Show all your working**

1. Record the ***density of water*** here: ............................................................................
2. Record the total weight of your team here in ***grams***: .............................................................................................
3. What do the letters in the following formula represent? $d=\frac{m}{v}$

D=............................. M=........................... V=............................

1. Your boat will need to be less dense than water to make it float. (i.e. when you divide the ***weight*** (mass) by the ***volume***, the answer is 0.9/cm3 ). Use the formula to try some different volumes that will make your boat density 0.9/cm3. Show your working here. $d=\frac{m}{v}$

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***Calculate the plimsoll line (the level of the water when your group are in the boat)***

1. Now work out the ***height*** of the sides of your boat. Use the ***volume*** you calculated in 4. Divide this figure by the ***area*** worked out in E. Height will be in cm.

$v=a×h$ (Volume = Area x height). ***We have the volume and the area but need the height!***

$h=\frac{v}{a}$ (Rearranged formula)

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1. What assumptions (*things you may not have measured or thought about*) have you made about your life size boat in these calculations? How could this affect the way your boat floats?

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*\*\*\*\*When you have completed parts 1 and 2 see your teacher before beginning part 3.\*\*\*\**

**Part 3**

**Make your scale Models *(Photos or Video)***

1. Now make your boat using the scale drawing from D. Create the sides from the figure in step 5.

(remember to scale down this number as well)

1. Make your scaled down people. (To scale your people down, divide the weight in grams by 103). Record here.

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1. When you are ready, float your boat!

**Due Date Week 6 Science Lessons**