

Teacher Instructions

- Watch the opening two minutes of <http://www.youtube.com/watch?v=MGixcQ4DZT> [M](#) to set the scene.
- Run through slides 2-9. Hand out slides 10-16 to each group.
- Show slide 17 when peer marking the posters or whilst your students are preparing their poster.
- Get pupils to hold up a card with a letter to show their answers to the plenary questions.



Objective: To calculate pressure and apply to a real life situation.

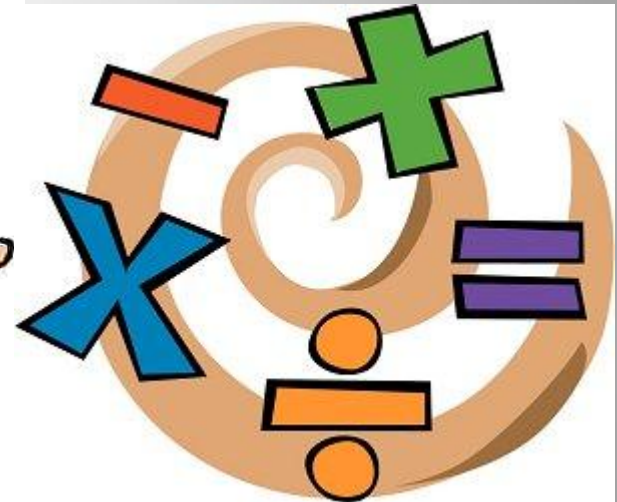
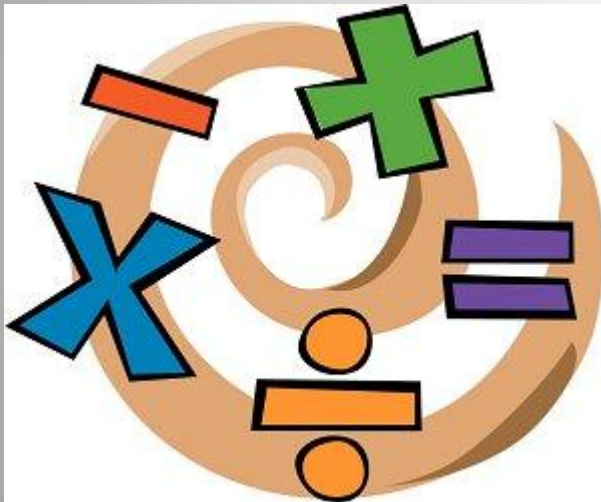
Outcomes

- All Should:
 - Recall the equation for calculating pressure (level 4)
- Most should:
 - Use the equation to calculate pressure (level 5)
- Some should:
 - Provide scientific evidence to back up a decision made (level 6)

A dangerous Job



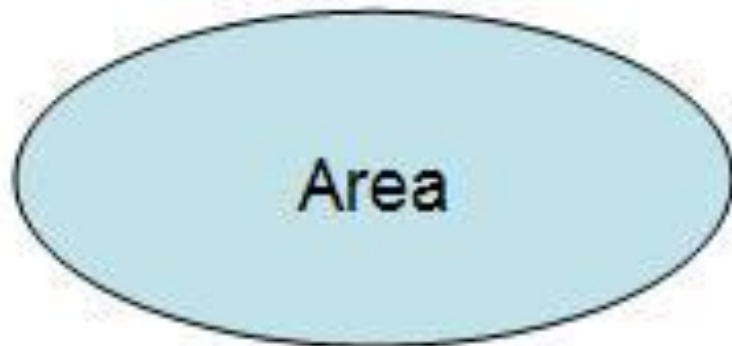
But Science and Maths help to
make it possible!



How would you work out how much pressure is being put on the ice?



Force



Area

$$\text{Pressure} = \text{Force} \div \text{Area}$$

Its weight (the force)
is 400000 N.

The trucks tyres have an
area 1000cm² in contact
with the ice



Pressure = Force / Area

400000 / 1000 = 400 N/cm²

The ice road can withstand pressure of up to 500N/cm².

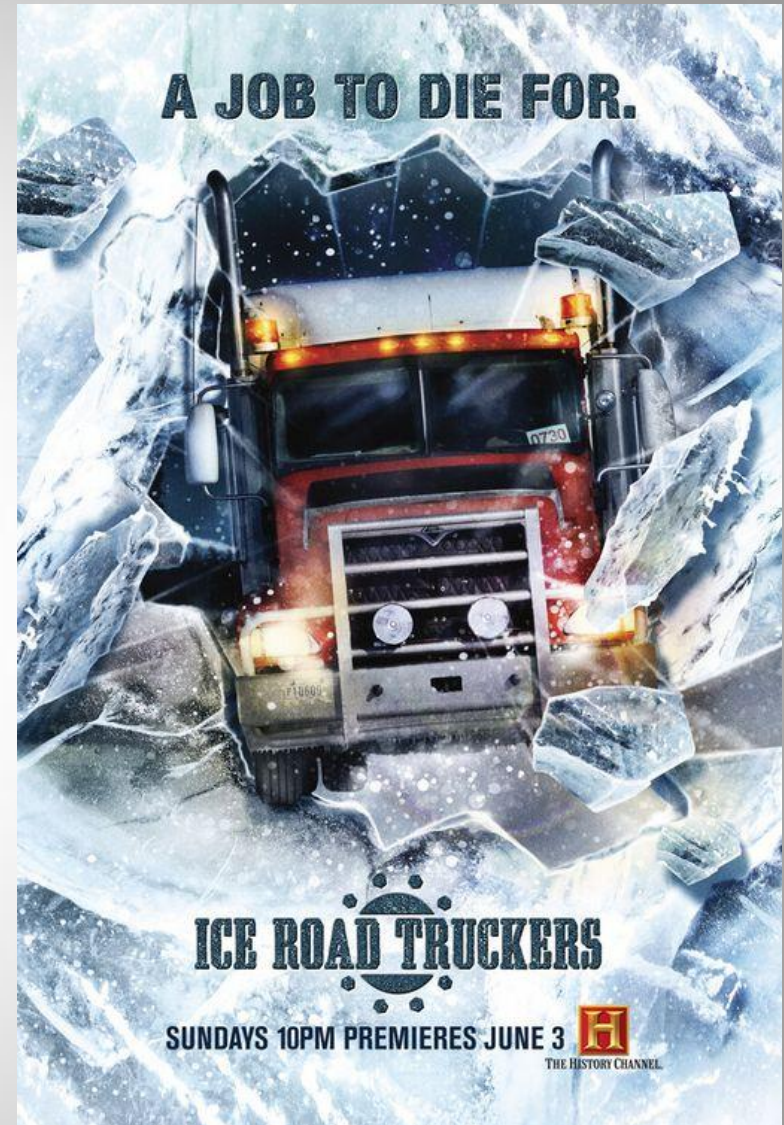
The ice road can withstand pressure of up to $500\text{N}/\text{cm}^2$.



So the truck will not break ice!

Group task

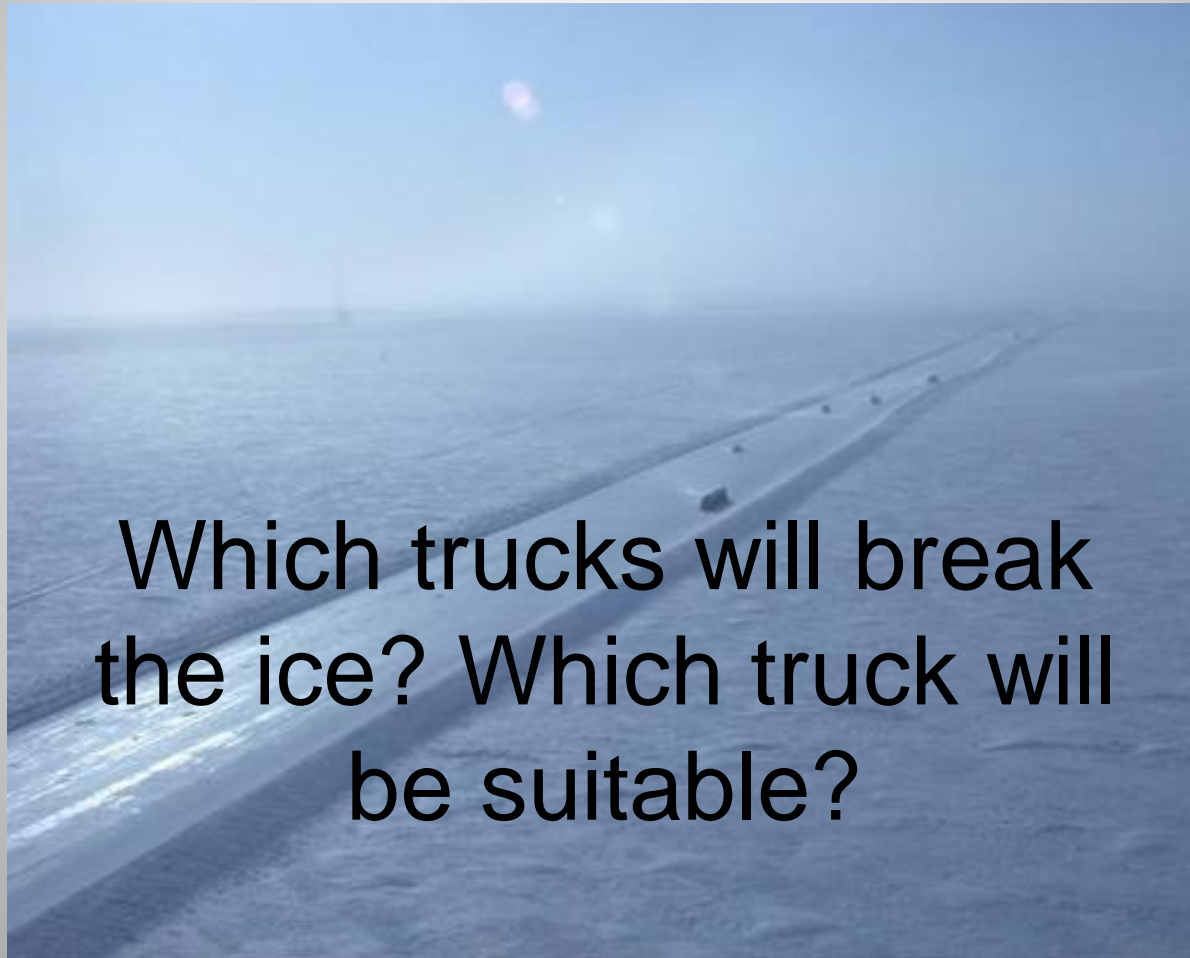
- You are the latest recruit for the ice road truckers.
- You must select a vehicle that will drive on the ice roads.
- It must not fall through the ice!



How to achieve in this task

- Work out the amount of pressure that each truck puts on the ice.
- Select which truck will be able to do the job.
- Present your findings in the form of a poster.

The ice road can withstand pressure of up to 500N/cm^2 .



Truck Name: Do not say Snow to me!
Weight: 500,000 N
Area of Tyres: 800cm²



Truck Name: Ice Ice Baby

Weight: 400,000 N

Area of Tyres: 500cm²



Truck Name: It's Snow Joke
Weight: 600,000 N
Area of Tyres: 1000cm²



Truck Name: Ice to Meet You
Weight: 400,000 N
Area of Tyres: 900cm²




Peer Marking

- Swap posters with another group. Award it a level based on the outcomes of the lesson.
- Recall the equation for calculating pressure (level 4)
- Use the equation to calculate pressure (level 5)
- Provide scientific evidence to back up a decision made (level 6)

Plenary: Hold up the correct card

What is the equation for pressure?

- (a) Pressure = force/mass
- (b) Pressure = area/force
- (c) Pressure = force/area 
- (d) Pressure = mass/area

Plenary: Hold up the correct card

An elephants weight is 12000N and the area of its feet is 400cm² .How much pressure does the elephant exert on the ground?

- (a) 1000N/cm²
- (b) 8000N/cm²
- (c) 12400 N/cm²
- (d) 30N/cm²

