****

**Bridge Building Pupil Sheet**

Your challenge is to design a bridge from paper that will span a 1m gap. Your bridge must be designed to carry a certain amount of traffic and hold the corresponding weight of traffic. You will need to carry out some calculations to ensure you meet the specification and is profitable**.**

**Specification**

Your bridge must do the following:

* Span a 1m gap
* Hold a mass 1.5x the total calculated bridge capacity
* Have as short a payback time as possible
* Maximise the amount of profit during life of the bridge (100 years)

**Information for Calculations**

The cars travel at a speed of 0.1 m/s

For safety, cars must must have at least 30 cm between each car

Each lane must have a width of 4 cm to accommodate vehicles

Vehicles will be charged a toll to cross the bridge of 10p.

Payback time is the time it takes for the tolls to pay for the cost of the bridge build – i.e. the time it takes the company who builds the bridge to start making profit.

Your bridge is expected to be popular so will always work at peak capacity.

Each vehicle weighs 67g and your bridge must be able to hold a 150% of a full load of traffic for safety.

**Design Rules:**

* You can’t tape the bridge to the table
* You must use only materials provided
* Your teacher will put the test masses wherever they see fit and hold them steady if required. They are the final judge.

**Price List:**

* A4 sheet of paper: £750,000
* 3m of tape: £2,500,000
* Nut: £225, 000
* Bolt: £275, 000
* String: £2,000,000 /m