

## FORCE/MASS/ACCELERATION Teaching Guidelines

**Subject:** Mathematics

**Topics:** Algebra, Expressions and Equations

**Grades:** 9 - 12

**Knowledge and Skills:**

- Can do arithmetic operations with numbers that are expressed in scientific notation
- Can evaluate expressions by substituting values for variables
- Can do basic operations on both sides of an equation in such a way as to preserve the equality

**Materials:** None

**Procedure:** This project should be done by students individually.

Distribute the handout and discuss it. Tell students to imagine that they are part of a new car engineering team and their boss has asked them to work out some possible acceleration options for a new car design. They are to determine the missing figures in the chart. Ensure that students understand the assignment.

**Answers:**

Force (newtons)	Mass (kg)	0 to 60 time (secs)
10000	3500	9.4
10422	3500	9.0
10000	2985	8.0
11486	3000	7.0
7500	1959	7.0
Answers vary	Answers vary	6.0



**New Model Design Specification Sheet 14A-678**

**Engine Force/Mass/Acceleration Options**

**Initial Approximations Use the relationship  $F = 26.8m/t$  to find the missing values:**

<b><i>F</i></b> Force (newtons)	<b><i>m</i></b> Mass (kilograms)	<b><i>t</i></b> 0 - 60 mph time (sec)
$10^4$	$3.5 \times 10^3$	_____
_____	$3.5 \times 10^3$	9.0
$10^4$	_____	8.0
_____	$3.0 \times 10^3$	7.0
$7.5 \times 10^3$	_____	7.0
_____	_____	6.0