

# Mechanical Physics Simulation:

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## TEACHER BRIEFING

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Background Information	
<b>Overview &amp; Objectives</b>	<p>This pack of simulations is designed for year 12 students taking AS level in Physics.</p> <p>The simulations test the student's knowledge on the subject of mechanical physics. Students will also be tested on graphic data analysis and fundamental physics in an integrated context.</p> <p>The first simulation ('The Apollo') contains three parts, each part tests one set of questions relating to 'equation of motion'. The variables are generated randomly as students request them. They are encouraged to do to their own calculation and check for correct answer, but in case there are difficulties, hint and full answer will be provided.</p>
<b>Main Learning's</b>	<p>As this is a revision simulation package, students' knowledge and skills will be strengthened based on how to:</p> <ul style="list-style-type: none"> <li>• Use the formula and understand the concepts within the topic.</li> <li>• Apply their knowledge in an integrated context.</li> <li>• Analyse graphic data and derive the relationship between variables</li> <li>• Provide answers to questions similar to the real practical test or experiments.</li> </ul>
<b>Components of the Sim</b>	<p>The simulation consists of the following components:</p> <ul style="list-style-type: none"> <li>• The teacher briefing</li> <li>• The student instruction sheet</li> <li>• The simulation pack</li> <li>• Use of the SpreadSims platform at <a href="http://server.spreaddsims.net">http://server.spreaddsims.net</a></li> <li>• Pre quiz and Post quiz</li> </ul>
<b>Size of Groups</b>	<ul style="list-style-type: none"> <li>• The simulation package is designed for individual use, but can also be used by a team of up to 2 or 3 students for this level.</li> </ul>
<b>Usage suggestions</b>	<ul style="list-style-type: none"> <li>• The pre quiz will be done inside a normal classroom to test students' knowledge of the topics and analytical skills.</li> <li>• Students will then be provided with the first simulation ('The Apollo') to use outside the classroom.</li> <li>• Afterward students will need to finish a post quiz which contains relevant and more advance questions, either in the lab or outside the classroom.</li> </ul>

**Measures of Learning**


The key measures of learning are listed below:

- No. of correct answers from each student.
- Satisfaction rating of the activity from each student.
- The improvement from each student before and after the experience with simulation package when they do similar or more complex questions within the topics.
- Teacher using the data to improve teaching techniques.
- Time saving for teacher to mark the assessments.
- Other comparisons to the control groups

**Screenshots of Sim: Apollo**

**Physics**

Decisions Area



**Captain:**  
The UFO seems to have flown away and left us alone, the radar is tracking the large alien space ship but it keeps blimping off the screen, and the computer is busted from the attack and can't compute the alien ship's trajectory.

We know the space ship is moving at a linear velocity relative to our position but we need to know how fast it is moving and whether it is retreating or if it is moving forward for another attack.

I have sent you some raw data from the radar, we need to know where the hostile ship is going and how fast it is moving.

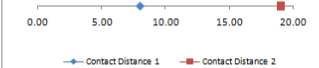
**Radar Data**

Contact 1		
Time	3.00	Seconds
Distance	8.00	Meters

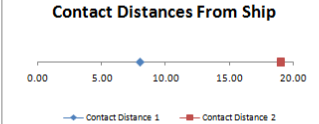
Contact 2		
Time	12.00	Seconds
Distance	19.00	Meters

**Contact Times**



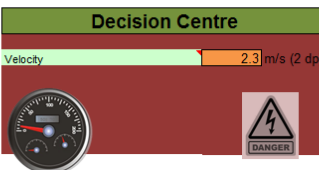
Contact	Time (Seconds)
Contact 1	3.00
Contact 2	12.00

**Contact Distances From Ship**



**Decision Centre**

Velocity 2.3 m/s (2 dp)



**WRONG**

Time Between Contacts Time 2 - Time 1 = 12 - 3  
9

Distance Traveled Between Contacts Distance 2 - Distance 1 = 19 - 8  
11

Velocity Distance/Time = 11/9  
1.22

PLACE SIM ADD-IN HERE