

### TinkerCAD Lesson

<b>Grade Level</b>	9	<b>Workable grades</b>	8, 9, 10
<b>Recommended Time</b>	1 hr		
<b>Curriculum Alignment</b>	<p><b>Math 9</b></p> <p>Math SHAPE AND SPACE 4 : Draw and interpret scale diagrams of 2-D shapes.</p> <p>Math SHAPE AND SPACE 5: Demonstrate an understanding of line and rotation symmetry.</p>		

<b>Background Information (Science required for the lesson) :</b>	<b>Notes</b>
<p>Importance of 3D Modeling in general</p> <ul style="list-style-type: none"> <li>● 3D modeling has changed the way we design; for the better. Not only does 3D modeling help us visualize space requirements, but also improves drawing efficiency and accuracy. 3D models can also help spark important conversations during the design phase and potentially avoid costly construction mishaps.</li> <li>● Alberta Sat and how they use 3D models</li> <li>● Basic features: <ul style="list-style-type: none"> <li>○ Panning can be done by holding shift and dragging with the right button (mouse).</li> <li>○ Zooming: scroll wheel.</li> <li>○ Rotating: right button + move. OR use the cube in the top left hand corner.</li> <li>○ Resizing can be done with dragging the corners. OR you can be more precise and input the length</li> </ul> </li> </ul>	<p>For the intro of basic features, if students don't have a mouse:</p> <ul style="list-style-type: none"> <li>● Panning: shift + two-fingers and hold down the trackpad</li> <li>● Zooming: two fingers moving on the trackpad</li> <li>● Rotating: two fingers and hold the trackpad + move</li> </ul>

- With shapes, you can use the steps/bevels slider to round out corners.
- Grouping: select the shapes you want to group. Then click the group icon in the left hand corner or CTRL + G.



- Ungrouping: Select the grouped shapes and click the icon on the left hand corner or CTRL +SHIFT+ G.



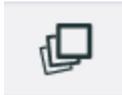
- If you don't like something just do CTRL+Z

- Objects:

- Moving directly up requires you to add a workplane and drag it upwards directly against the plane. Workplanes also allow snapping to its grid which could come in handy.
- If you want to align two objects together, you can use the align tool. Select the two objects you want to align, then click the align tool. You can align the shapes in the xplane, y plane or z plane.



- Duplicating: CTRL+C OR Clicking the multiple square on the top left



- When you group shapes together they might change to

the same colour, however there is a way to keep the shapes a different colour, before grouping the shapes make sure they are the colour you want. Once the shapes have been grouped, click the colour and at the bottom of the selection there should be a box labelled 'Multicolour'.



- If you want to duplicate an object, but in a different orientation, you can use the mirror function. Select the object you want to mirror and click the mirror function in the left hand corner



Explanation of Activity:	Notes:
<ol style="list-style-type: none"> <li>1. Have students login to TinkercAD.</li> <li>2. Have students click on "Create a new design"</li> <li>3. Name design "My rocket"</li> <li>4. Start the design of the rocket with a cylinder.</li> <li>5. Add nose cone using the workplane/align</li> <li>6. Group the shapes</li> <li>7. Show how to revolve a surface</li> </ol>	<ol style="list-style-type: none"> <li>1. If they don't have an account, have them use a <b>personal account</b> with a google account</li> </ol> <p>MAKE SURE STUDENTS DO NOT USE ONE OF THE TEMPLATES</p>



8. Give students time to be creative and design their rocket!	

<b>Materials Required (INCLUDE ALL MATERIALS NEEDED EVEN PEN AND PAPER)</b>
<ul style="list-style-type: none"><li>• Computer</li><li>• Mouse (optional, but it would make it easier on students)</li><li>• TinkerCAD account (will be made during the lesson)</li><li>• Internet access</li></ul>

<b>Changes to the activity for COVID-19</b>
A Zoom call with the AlbertaSat members sharing their screen on the class projector screen should allow this activity to proceed nearly as described. Questions from students may have to be collected by the onsite teacher, or asked to the class at large to be heard by AlbertaSat members.