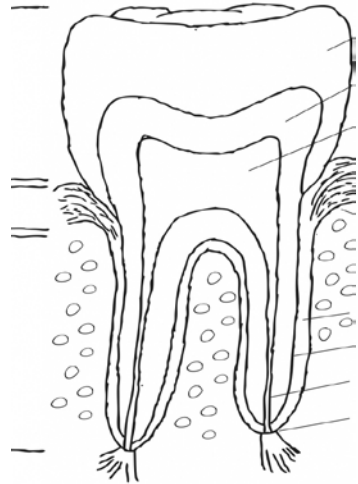


# EXAMPLE SHEET - TOOTH ENAMEL

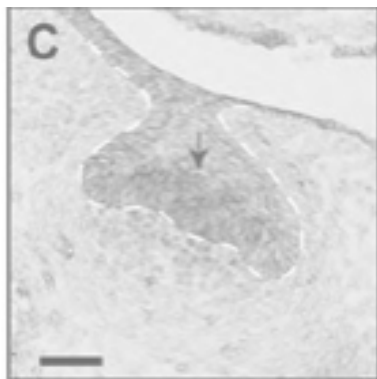
## Optical – Stereo

Description/Observations



## Optical – Compound

Description/Observations



There are three main sections to the tooth cross section. A dentin...

Description/Observations

What shapes do you see?  
Draw or describe five major features of the tooth enamel at your chosen resolution

Microscope Question

Scale: Write the scale of your image here, e.g. 0.5µm

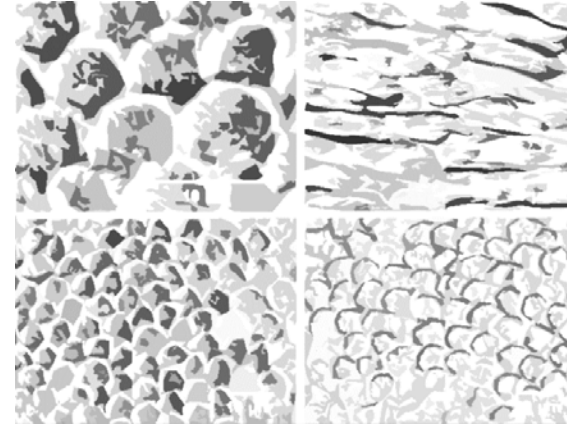
Description/Observations

What shapes do you see?  
Draw or describe five major features of the tooth enamel at your chosen resolution

Microscope Question

## SEM

Description/Observations



Description/Observations

Microscope Question



Sample: TOOTH ENAMEL	OPTICAL - STEREO	SEM	Name: _____	
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            What shapes do you see?            Draw or describe three to five major features of the tooth and enamel at your chosen resolution.</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe what you can see from a section of the SEM sample. What features can you now identify that you could not resolve on the optical microscopes?</p>	
	<p><b>Microscopy Question</b>            Describe how you would determine the thickness of the enamel layer? What does the name 'stereo microscope' indicate about the type of image you can see?</p>		<p><b>Microscopy Question</b>            Why are images from Scanning Electron Microscopes produced in black and white? Why is silver paint used to connect the tooth sample to the stub it sits on?</p>	
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>	<p><b>Scale:</b></p>
		OPTICAL - COMPOUND	ATOM PROBE & MICRO-CT	
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe any new features that you see that you could not see with the stereo microscope</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe what patterns you can see in the rotating atom probe image. What structure might you be seeing here based on what you observed previously?            Underneath this, draw a cross section of a tooth based on what you saw in the MicroCT cutaway. Mark the boundaries of each section of tooth that are visible in MicroCT</p>	
	<p><b>Microscopy Question</b>            What is the difference between Bright Field and Dark Field imaging?             What dimensions are samples viewed in on stereo and compound microscopes? Why do you think they are different?</p>		<p><b>Microscopy Question</b>            Why are atom probe techniques considered 'destructive'? Explain how X-Ray MicroCT can reveal the 3D structure of an object.</p>	
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>	<p><b>Scale:</b></p>

Sample: CORALLITE	OPTICAL - STEREO	SEM	Name: _____
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            What shapes do you see?            Draw or describe five major features of the coral polyp at your chosen resolution.</p> <p>What parts do you think they correspond to in a living coral polyp? How might you classify this coral based on the arrangement of polyps and their walls?</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe what you can see from the SEM image you have chosen.            What new polyp or other features can you now identify?</p>
	<p><b>Microscopy Question</b>            Describe how you would determine the diameter of a coral polyp from the walls on the corallite using a microscope?</p>		<p><b>Microscopy Question</b>            Explain why images from Scanning Electron Microscopes are produced in black and white. Why does part of the image get very bright?</p>
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>
	<b>OPTICAL - COMPOUND</b>	<b>MICRO-CT</b>	
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe the features that you see at this chosen magnification.            Are there any patterns in how the coral polyps are structured?</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe what you can see in the image from the Micro-CT. What structure might you be seeing here?</p>
	<p><b>Microscopy Question</b>            What is the difference between Bright Field and Dark Field imaging?</p> <p>What dimensions are samples viewed in on stereo and compound microscopes? Why do you think they are different?</p>		<p><b>Microscopy Question</b>            Explain how X-Ray MicroCT can reveal the 3D structure of an object.</p>
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>

Sample: EUCALYPTUS LEAF	OPTICAL - STEREO	SEM	Name: _____
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            What shapes do you see?            Draw or describe five major features of the eucalyptus leaf at your chosen resolution.</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe key features that you can see from your chosen SEM image, and where they are located.            Which features are most dominant, and why do you think they are important for the leaf?</p>
	<p><b>Microscopy Question</b>            Describe how you would determine the size of cells within this leaf and the distance between leaf veins using a microscope?</p>		<p><b>Microscopy Question</b>            Explain why images from Scanning Electron Microscopes are produced in black and white. What are the samples sticking to underneath, and why?</p>
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>
	OPTICAL - COMPOUND	3-VIEW	
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe the features that you see at this chosen resolution. Why is the cross section of a leaf different from the surface?</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Describe what you can see in one of the images from the 3View reconstruction. What do you notice about the shape of eucalyptus leaf cells and the pore space?</p>
	<p><b>Microscopy Question</b>            What is the difference between Bright Field and Dark Field imaging?             What dimensions are samples viewed in on stereo and compound microscopes? Why do you think they are different?</p>		<p><b>Microscopy Question</b>            Explain the difference between regular SEM and 3View SEM.</p>
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>

Sample: RUSTICLE	OPTICAL - STEREO	SEM	Name: _____
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            What shapes do you see?            Draw or describe some major features of the surface or crevices of the rusticle at your chosen resolution. In what direction do you think the rusticle has grown, and why?</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Draw or describe five shapes or patterns you can see from the SEM image.            Can you identify any clear boundaries between collections of different shapes?</p>
	<p><b>Microscopy Question</b>            Describe how you would determine the width of a crack in a rusticle piece based on knowing the magnification of the microscope.</p>		<p><b>Microscopy Question</b>            Explain why images from Scanning Electron Microscopes are produced in black and white. Why are some points in the image particularly bright?</p>
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>
	OPTICAL - COMPOUND	3D CAMERA SCAN	
<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Describe the features that you see at this chosen resolution. What are you seeing? How are the rusticles different to regular rust?</p>	<p><b>Draw your diagram and write your descriptions/observations here:</b></p>	<p><b>Observations and Inferences</b>            Describe what additional features you can see in the 3D Camera Scan. What do you notice about the interior density of the rusticle? Why do you think there are light and dark spots on the surface?</p>
	<p><b>Microscopy Question</b>            Do you think this type of microscope reveals new information about the rusticle? Justify your answer?</p>		<p><b>Microscopy Question</b>            What are some of the advantages and disadvantages of using a 3D camera scan instead of Atom Probe, 3View, MicroCT or other reconstructions?</p>
	<p><b>Scale:</b></p>		<p><b>Mag:</b></p>