

Tuesday 9<sup>th</sup> March 2021



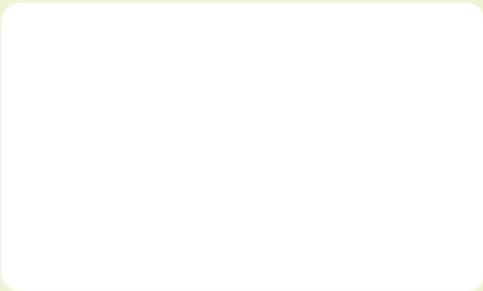
<i>Learning Objective</i> <i>To design a Robo-bug.</i>		
<i>Success Criteria</i>		<i>Self Assessment</i>
<ul style="list-style-type: none"><li>• <i>Recognise how different insects have evolved to help them survive in different habitats.</i></li></ul>		
<ul style="list-style-type: none"><li>• <i>Think about the goal and challenges your robo-bug will have.</i></li></ul>		
<ul style="list-style-type: none"><li>• <i>Choose an insect that will help to solve the challenges.</i></li></ul>		

*Insects have evolved loads of fascinating features to help them survive in almost every habitat on Earth. These amazing abilities have inspired robots used for things like rescue missions and even space exploration! In this activity you will design robots inspired by insects to help solve challenges like these.*

### *Instructions*

- 1. Choose a goal from the table and read the challenges that need solving to be successful. You could also think of your own goal and list 2-3 challenges that might need to be solved for that instead!*
- 2. Discover the different insects and their abilities and adaptations.*
- 3. Think about the challenge you're trying to solve, and which insect features are the best for solving it e.g. rescue robots might need to be good at crawling over rough ground, while ocean-exploring robots might need powerful eyes for spotting interesting things in the deep-sea.*
- 4. Draw your new robot on some paper, start with the body and then add on the insect-inspired bits you want your robot to have.*
- 5. Colour your robo-bug in (colours might be an important part of your design, depending on what you want your robot to be doing).*
- 6. Label the robot's features and show how they help solve the challenges for the goal you chose earlier.*

7. You can also create a 3D robo-bug using modelling material. Place it on a piece of paper and draw arrows to label all the features.

Goal	Challenges
Search and Rescue	<ul style="list-style-type: none"><li>✓ Uneven ground</li><li>✓ Detecting survivors or dangers</li><li>✓ Showing others where survivors are trapped so they can be rescued</li></ul>
Exploration (space, oceans, volcanoes etc.)	<ul style="list-style-type: none"><li>✓ Movement through environment (space, water, rocky mountains etc.)</li><li>✓ Observing and showing surroundings to pilots and scientists</li><li>✓ Collecting things to bring back to base for studying more.</li></ul>
Construction	<ul style="list-style-type: none"><li>✓ Carrying heavy objects</li><li>✓ Easy to see, for safety</li><li>✓ Able to work in a group of robots</li></ul>
Your own idea here: 	<ul style="list-style-type: none"><li>✓</li><li>✓</li><li>✓</li></ul>

Insects	Abilities
Bees	<ul style="list-style-type: none"> <li>✓ Pollen baskets for collecting pollen</li> <li>✓ Great communicators</li> </ul>
Ants	<ul style="list-style-type: none"> <li>✓ Incredible teamwork</li> <li>✓ Strong (lifting and carrying objects)</li> </ul>
Dragonflies	<ul style="list-style-type: none"> <li>✓ Powerful compound eyes</li> <li>✓ Agile fliers</li> </ul>
Crickets	<ul style="list-style-type: none"> <li>✓ Powerful legs for jumping</li> <li>✓ Loud calls for signalling</li> </ul>
Butterflies & Moths	<ul style="list-style-type: none"> <li>✓ Caterpillars spin silk</li> <li>✓ Can have bright, vibrant wing markings or be masters of camouflage</li> </ul>
Katydid & Stick insects	<ul style="list-style-type: none"> <li>✓ Impressive camouflage</li> </ul>
Beetles	<ul style="list-style-type: none"> <li>✓ Hard, protective exoskeleton</li> <li>✓ Can crawl through tight gaps and rough undergrowth</li> </ul>



Agile fliers -  
Dragonfly



Armour -  
Rhino beetle



Camouflage -  
Dead leaf butterfly



Camouflage -  
Leaf katydid



Burrowing -  
Scarab



Bright patterning -  
Leopard butterfly



Camouflage -  
Walking leaf



Material collection -  
Carpenter Bee



Bright patterning -  
Sloan's Urania



Bright patterning -  
Swallowtail



Bumble bee -  
Swarm teamwork



Powerful eyes -  
Dragonfly



Powerful legs -  
Grasshopper

### *Additional Activities*

*At home find an insect (inside or outside) and watch it closely. What features does it have that help it survive? Remember not to harm the insect and return it as quickly as possible to where you found it.*

*Visit [MyLearning.org](http://MyLearning.org) and type 'insects' into the search bar to discover even more about all the amazing ways insects survive, and how scientists are building robots inspired by these insect abilities to tackle loads of exciting and important challenges.*