**STEM Design Challenge – Animals at Home**

**Teacher Frequently Asked Questions**

**What is the STEM Design Challenge?**

Design solutions for animals featured in the Animals at Home live streams! F-10 students will use their STEM skills, knowledge and an engineering framework called Design Thinking. They are also invited to share a video of their design with their peers and Zoos Victoria.

This program is part of Zoo Education Online – [www.zoo.org.au/education/zoo-education-online](http://www.zoo.org.au/education/zoo-education-online)

**How much does it cost?**

The Zoo Education Online version of the STEM Design Challenge is **free**.

It will run until teachers are once again able to take their students on excursions.

**What will students learn?**

* How to research a big STEM problem
* How to combine STEM knowledge and skills through the sequence of Design Thinking
* How to brainstorm ideas and choose one to try
* How to visually show an idea to others
* How to test and refine an idea

**What support is available?**

Zoos Victoria is here to help you and your students by providing:

* A step-by-step Teaching Guide, including an assessment rubric
* Student workbooks in MS Word format
* YouTube videos, including Animals at Home live streams
* Student webinars (so they can chat with zoo experts)

Here are two ways to use the STEM Design Challenge in your teaching:

1. Add to your own learning system – download MS Word docs, copy/embed YouTube links

2. Send students directly to Zoos Victoria’s website for MS Word doc instructions and links

**How long does the STEM Design Challenge run for?**

This is up to you. Some teachers use this program as the centre of a whole-term unit. Others use it as part of a special program that runs for 1-3 weeks. The Teaching Guide will help you walk your students through each stage of Design Thinking at your own pace.

**What is Design Thinking?**

Design thinking is a process where a need is identified and a solution is developed. The process helps solve a challenge that needs multiple solutions. There are four stages:

|  |  |  |  |
| --- | --- | --- | --- |
| **Understand**Researching and asking questions | **Ideate**Brainstorming solutions | **Prototype**Building their design | **Test and Refine**Testing and improving their design |

The Design Thinking process is not linear – students may need to return to different stages in order to deepen their understanding or try a new design idea.

**What is a prototype?**

A prototype is a visual representation of an idea. Prototypes can include 3D models, drawings, animations and videos.

**Do my students need special materials or technology?**

Not at all. Just like real-life designers, students should use any of the materials available to them to create their prototype e.g. recycled materials from home, computers, tablet devices

**How can my students share their designs with Zoos Victoria?**

The Teaching Guide and Student Workbooks include instructions on how to upload student videos to YouTube. Once students let us know their video link, we will add it to the YouTube playlist for everyone, including zoo keepers, to watch. Students will need parent/guardian permission before they upload anything online. They can choose to have their face in their video or narrate it from behind the camera or using a PowerPoint slide deck.

**My student has a question. Where can they get an answer?**

Your Teaching Guide includes a list of how students can conduct their research. Zoos Victoria also provides **free webinars** where students can chat with a zoo expert.

Check out the website for upcoming dates and videos of past recorded sessions.



**Need some help? Join the Teacher Tribe
Facebook group to chat with zoo staff and other teachers** [**www.facebook.com/groups/zvteachertribe/**](http://www.facebook.com/groups/zvteachertribe/)

**What are the curriculum links?**

Here is how you might use the STEM Design Challenge to teach the Victorian Curriculum:

|  |  |  |
| --- | --- | --- |
| **Level** | **Learning Area** | **Content Descriptor** |
| F-2 | Science | Living things have a variety of external features and live in different places where their basic needs, including food, water and shelter, are met |
| F-2 | Design and Technologies | Visualise, generate, and communicate design ideas through describing, drawing and modelling  |
| F-2 | Critical and Creative Thinking | Identify, describe and use different kinds of question stems to gather information and ideas |
| 3-4 | Science | Different living things have different life cycles and depend on each other and the environment to survive |
| 3-4 | Design and Technologies | Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques |
| 3-4 | Critical and Creative Thinking | Investigate a range of problem-solving strategies, including brainstorming, identifying, comparing and selecting options, and developing and testing hypotheses |
| 5-6 | Science | Living things have structural features and adaptations that help them to survive in their environment |
| 5-6 | Design and Technologies | Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques |
| 5-6 | Critical and Creative Thinking | Investigate how ideas and problems can be disaggregated into smaller elements or ideas, how criteria can be used to identify gaps in existing knowledge, and assess and test ideas and proposals |
| 7-8 | Science | Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations |
| 7-8 | Design and Technologies | Generate, develop and test design ideas, plans and processes using appropriate technical terms and technologies including graphical representation techniques |
| 7-8 | Critical and Creative Thinking | Consider how problems can be segmented into discrete stages, new knowledge synthesised during problem-solving and criteria used to assess emerging ideas and proposals |
| 9-10 | Science | Scientific knowledge and understanding of the world changes as new evidence becomes available; science knowledge can develop through collaboration and connecting ideas across the disciplines and practice of science |
| 9-10 | Design and Technologies | Apply design thinking, creativity, innovation and enterprise skills to develop, modify and communicate design ideas of increasing sophistication |
| 9-10 | Critical and Creative Thinking | Investigate the kind of criteria that can be used to rationally evaluate the quality of ideas and proposals, including the qualities of viability and workability |