

Computational Thinking in Action

A catalyst for growth and extension of Computational Thinking in the classroom.

What is Computational Thinking?

Computational Thinking is a set of skills that underpin learning within the Digital Technologies classroom. These skills allow students to engage with processes, techniques and digital systems to create improved solutions to address specific problems, opportunities or needs.

The six Computational Thinking skills:



DECOMPOSITION

Breaking down data, processes, or problems into smaller, manageable parts.



PATTERN RECOGNITION

Observing patterns, trends, and regularities to make sense of data.



ABSTRACTION

Identifying and extracting relevant information.
The process of ignoring or removing unnecessary information.



MODELLING AND SIMULATION

Developing a model to imitate processes and problems.



ALGORITHMS

Creating an ordered series of instructions for solving similar problems or for doing a task.



EVALUATION

Determining the effectiveness of a solution and generalising.
Applying that information to new problems.

Thinking about Computational Thinking

Sort

Computational Thinking Skills

Not important in the problem or solution

Important but not critical in the problem or solution

Critical in solving the problem or creating the solution

Compare

Strategies



Challenges and successes



Other students' strategies



Wider problems and solutions

Apply

Understanding

Explore real-world examples



Create designs and projects



Present and communicate findings



Cell representation



Years 7-8
Years 9-10



Groups of 3



15 minutes

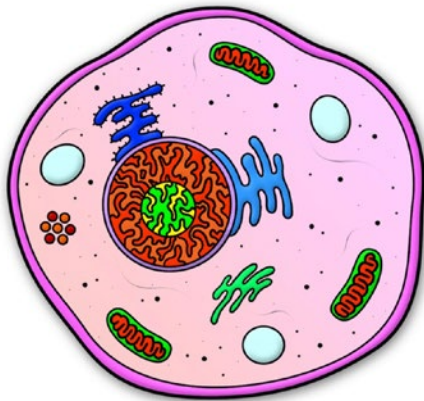


Pens/paper
Access to a device
with internet

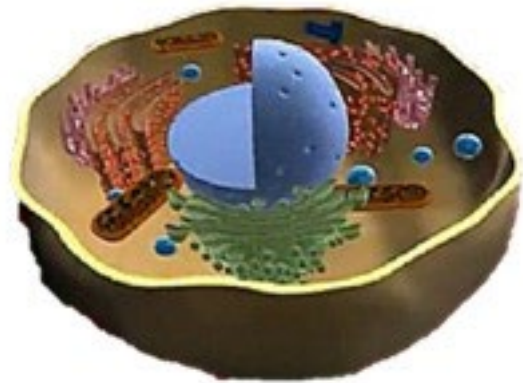
Student Instructions

Compare two different representations of a human cell below. Each student writes down one strength and one weakness of each representation on a piece of paper.

2 Dimensional cross section



3 Dimensional model



The perfect model

Imagine you could use VR technology to make the perfect model of a cell or another related biological concept. Attempt to brainstorm below the main features of your virtual reality tour that would make this representation the “perfect model”.



What are the steps in the tour?

What would it look like?

How would it make the audience feel?

What would it highlight?

Cell representation: extension

Kate Patterson

Check out digitalcareers.csiro.au/KatePatterson

Kate creates animations and 3 dimensional virtual models in the field of medicine. These models have revolutionized the way that medical professionals can view and discuss the human body.

Modelling in Science communication. Watch this video at digitalcareers.csiro.au/links

How does the digital representation in this video convey a message to the viewer? How is this different to the two dimensional and 3 dimensional models in the activity on the previous page?



Changing representations

Pick a career that you might be interested working in. Do some research into the ways that digital representations and modelling might be used in this career in the future.

Design a plan for a digital representation to improve a solution in your world

Use a design thinking process to create your own representation



Submit your design to YICTE!

www.youngictexplorers.net.au



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