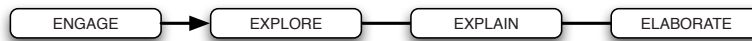


# sequence overview

## Molecular evidence for evolution



## Background

These SPICE resources may be drawn together into a learning pathway to develop students' understanding of how molecular biology advances have provided new insight into evolutionary relatedness. The pathway is structured around a constructivist model based on the 5-Es where teachers may:

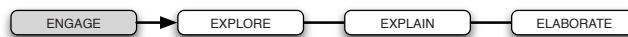
- **Engage** students' interest in evolutionary relatedness between mammals, using traditional evidence, via a card game;
- provide opportunities for students to **Explore** evolutionary relatedness between primates, based on physical and behavioural adaptations;
- **Explain** how molecular evidence has provided greater insight into relatedness between organisms and learn how to construct a visual representation of this with phylogenetic trees;
- **Elaborate** on a different form of evolution (viral) through use of an online research database; and
- **Evaluate** students' progress through the pathway and through summative reflection.

The resource is designed for year 12 students, but may also be used with students studying Year 10 Australian Curriculum: Science, at the discretion of the teacher.

## Introduction

This sequence relates a more traditional understanding of evolution, based on fossils, anatomical and embryological evidence, to a more current understanding of evolutionary relatedness that also considers molecular evidence from DNA, RNA and protein sequences.

## Learning pathway



### *Molecular evidence for evolution 1: Mammal evolution*

*Mammal evolution* includes a teachers guide, presentation, card game and teacher background sheets.

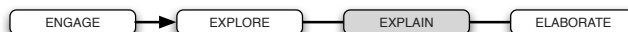
A card game engages student interest in evidence used to determine evolutionary relationships between eutherians (placental mammals). See the teachers guide for detailed information on the purpose and use of this resource.



### *Molecular evidence for evolution 2: Primates*

*Primates* comprises a teachers guide, two learning objects and worksheet.

Students use interactive learning objects to explore how anatomical evidence may be used to determine relatedness. See the teachers guide for detailed information on the purpose and use of this resource.



### *Molecular evidence for evolution 3: Evolutionary trees*

*Evolutionary trees* comprises a teachers guide, video, learning object, fact sheet, student worksheet and teacher background sheet.

The use of molecular evidence to determine relatedness between species is explained. Students draw evolutionary trees to represent relatedness. See the teachers guide for detailed information on the purpose and use of this resource.



### *Molecular evidence for evolution 4: Viral evolution*

*Viral evolution* comprises a teachers guide, fact sheet student worksheet and teacher background sheets.

Students use the Influenza Research Database to investigate virus evolution. This bioinformatics database is an authentic research tool used to compare genetic sequences of virus strains, and to construct cladograms to draw conclusions about their relatedness. See the teachers guide for detailed information on the purpose and use of this resource.

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