

Lesson: Glass animals, adaptations and biology

Phase of learning

Years 5 - 6, Years 7 - 8, Years 9 - 10, Senior Secondary (Years 11-12)

WA Curriculum

K-10 Science, SS Biology – General, SS Earth and Environmental Science – General, SS Marine and Maritime Studies – General

Region

North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

Summary

Students will explore a range of unique and fascinating transparent animals found in the world's oceans.

Duration

45 - 60 minutes

Preparation

The National Science Week school theme for 2022 is 'Glass: More than meets the eye' to celebrate the United Nations International Year of Glass. As transparency is one of the properties of glass that has made it such a prominent material in the world around us, these resources explore a range of unique and fascinating transparent animals found in the world's oceans, which we have termed here 'glass animals'.

The information and activities in these resources are linked to the Australian Curriculum and content descriptors are provided. We hope you enjoy exploring the wonderful world of marine glass animals!

All required information to teach this lesson can be found in the Fact Sheet: [Glass animals, adaptations and biology](#).

For years 5-6, students will require printed copies of the Teacher Resource Sheet: [Glass animals glossary and information cards](#) and Student Worksheet: [Glass animals adaptations and biology](#). Suggested answers can be found in the [Teacher Resource Sheet](#).

For years 7-12, students will require printed copies of the Teacher Resource Sheet: [Glass animals glossary and information cards](#) and Student Worksheet: [Glass animals adaptations and biology](#).

[biology](#). Suggested answers can be found in the [Teacher Resource Sheet](#).

We are excited to have developed these activities for use in your classroom.

Western Australian curriculum

LEARNING AREA	STRAND	SUB-STRAND	CODES
Science	Science understanding	Biological sciences	ACSSU030
Science	Science understanding	Biological sciences	ACSSU043
Science	Science understanding	Biological sciences	ACSSU044
Science	Science understanding	Biological sciences	ACSSU072
Science	Science understanding	Physical sciences	ACSSU020
Science	Science understanding	Biological sciences	ACSSU111
Science	Science understanding	Biological sciences	ACSSU150
Science	Science understanding	Biological sciences	ACSSU184
Science	Science understanding	Chemical sciences	ACSSU179
Science	Science understanding	Chemical sciences	ACSSU187
Science	Science understanding	Chemical sciences	ACSSU225
YEAR	COURSE	UNIT	STRAND
11	Biology General	2	Science understanding
11	Marine & Maritime General	2	Science understanding

11	Earth & Environmental Science General	2	Science understanding
----	---------------------------------------	---	-----------------------

Steps

1. Introduce today's topic, adaptations of marine animals, themed around animals with transparent tissues. Review why adaptations occur in nature and review the three broad types of adaptations (structural, physiological, behavioural).
2. Hand out glossary and information cards and student worksheets. Allow students to work in pairs as they use the resources provided to complete the activity.
3. Bring students together and discuss answers, paying particular attention to the advantages and disadvantages of transparent tissues, reproductive modes and bioluminescence (as applicable to year level).

Recommended Resources

Fact Sheet: [Glass animals, adaptations and biology](#)

Fact Sheet: [Fish Adaptations](#)

Additional Resources

Bhowal, A., & Purushothaman, J. (2020). Mollusca: Heterobranchia: Pteropoda. Faunal Diversity of Biogeographic Zones: Coasts of India, 595-602.

Davis, M. P., Sparks, J. S., & Smith, W. L. (2016). Repeated and widespread evolution of bioluminescence in marine fishes. *PloS one*, 11(6), e0155154.

Deibel, D., & Lowen, B. (2012). A review of the life cycles and life-history adaptations of pelagic tunicates to environmental conditions. *ICES Journal of Marine Science*, 69(3), 358-369.

Henschke, N., Everett, J. D., Richardson, A. J., & Suthers, I. M. (2016). Rethinking the role of salps in the ocean. *Trends in Ecology & Evolution*, 31(9), 720-733.

Kahlke, T., & Umbers, K. D. (2016). Bioluminescence. *Current Biology*, 26(8), R313-R314.

Keable, S. (2022). Deepsea Glass Sponge. Australian Museum Website. Published 4 April 2022. Accessed 2022-07-01. <https://australian.museum/learn/animals/sea-stars/sponges/invertebrates-collection-deepsea-glass-sponge/>.

Lisenkova, A. A., Grigorenko, A. P., Tyazhelova, T. V., Andreeva, T. V., Gusev, F. E., Manakhov, A. D.,

& Rogaev, E. I. (2017). Complete mitochondrial genome and evolutionary analysis of *Turritopsis dohrnii*, the “immortal” jellyfish with a reversible life-cycle. *Molecular phylogenetics and evolution*, 107, 232-238.

Petrescu-Mag, I. V., Proorocu, M., & Oroian, F. C. (2021). Jellyfish, aging and cancer research. *Extreme Life, Biospeology and Astrobiology*, 13(1), 2-6.

Ulanova, E. (2018). *Vitreledonella richardi* (glass octopus).

WoRMS Editorial Board (2022). World Register of Marine Species. Available from <https://www.marinespecies.org> at VLIZ. Accessed 2022-07-01. doi:10.14284/170

Related resources

[Fact Sheet: Glass animals, adaptations and biology](#)

[Student Worksheet: Glass animals adaptations and biology \(Year 5-6\)](#)

[Student Worksheet: Glass animals adaptations and biology \(Year 7-12\)](#)

[Teacher Resource Sheet: Glass animals adaptations and biology \(Year 5-6\) suggested answers](#)

[Teacher Resource Sheet: Glass animals adaptations and biology \(Year 7-12\) suggested answers](#)

[Teacher Resource Sheet: Glass animals glossary and information cards \(Year 5-6\)](#)

[Teacher Resource Sheet: Glass animals glossary and information cards \(Year 7-12\)](#)

[Fact Sheet: Fish Adaptations](#)

Keywords

adaptation, structural, functional, behavioural, aphotic zone, asexual reproduction, bioluminescence, broadcast spawning, budding, carbon sequestration, fertilisation, gametes, hermaphroditic, heterotrophic, notochord, oviparous, ovoviparous, photic zone, plankton, predation, sexual reproduction, silica, transparent, transdifferentiation, viviparous