KAKSIKIELISEN OPETUKSEN VERKOSTON WEBINAARI 28.2.2024 KLO 15-16

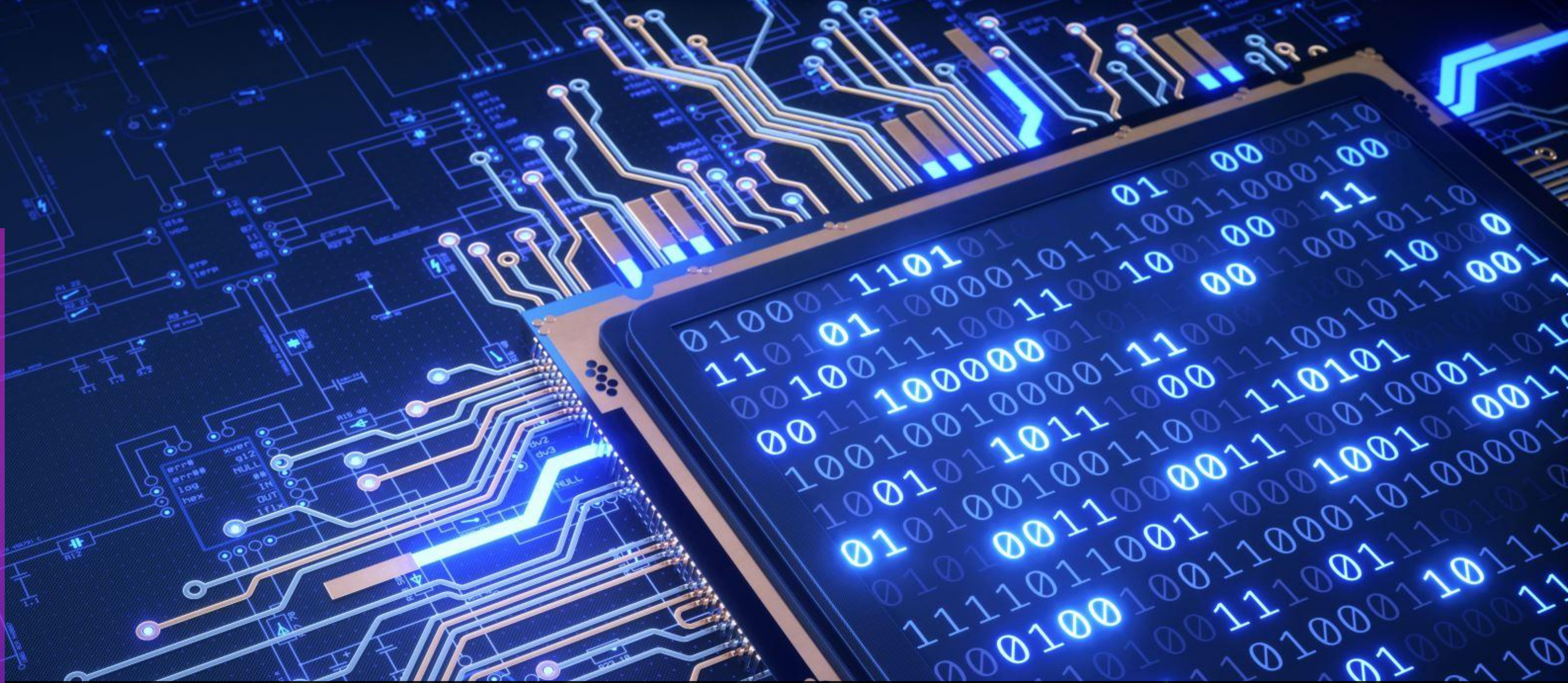
Helsinki

OPETUSHALLITUS RAHOITTAA HANKETTA

Teaching biology: a bilingual approach

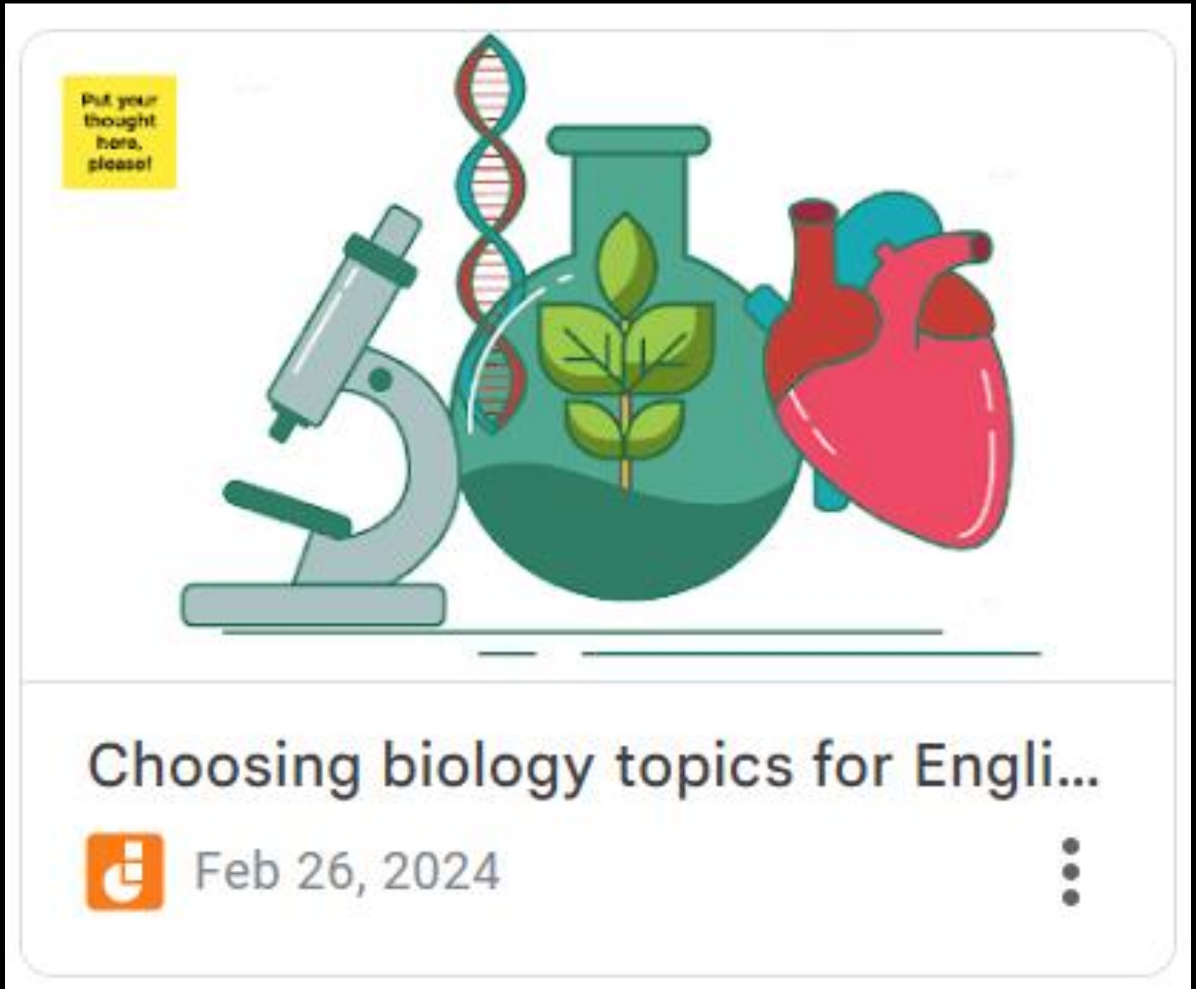
Anna Aaltonen

2024



"ChatGPT 3.5 was utilized to generate this comprehensive guidance, providing suggestions on selecting topics, designing pedagogical strategies, and promoting language acquisition in bilingual biology education. The AI also performed a spell check."

SCAN ME



Jamboard for sharing tested topics on 7th, 8th and 9th grade.

Choosing topics for instruction in English

- Select topics that align with global scientific terminology and concepts widely used in English literature.
- Identify core concepts or topics that are foundational to the biology curriculum. These may include fundamental biological processes, key principles, or essential terminology that students encounter repeatedly throughout their studies.
- Choose topics that involve universal biological principles and phenomena to facilitate comprehension and engagement.
- Be aware of prior learning.

Late autumn

THIS IS ME

Diversity and equality
Being a member of society

ME AS A SCIENTIST

Light and dark
Sound
Space
Mathematics – Scale, expanding and downsizing
Mathematics – Converting scale calculation into map interpretation and calculating distances

ME AS AN ARTIST

Art in different countries and cultures

Early spring

THIS IS ME

Organs
Life cycle and reproduction
Healthy lifestyle

ME AS A SCIENTIST

Mathematics – Coordinates and map coordinates
Mathematics – Connections between fractions and decimals and percentages

ME AS AN ARTIST

Different styles and genres of music
History of art – Different periods and their characteristics

Early autumn

THIS IS ME

Strengths and values
Me as a learner, learning strategies

ME AS A SCIENTIST

Energy
European countries and cultures
Continents and oceans
Mathematics – Revision of multiplication and division

ME AS AN ARTIST

Experimental arts and crafts

Late spring

THIS IS ME

Sustainable development

ME AS A SCIENTIST

Climate change
Democracy in Ancient Greece
Ancient Roman society
Mathematics – Volume
Mathematics – Perimeter

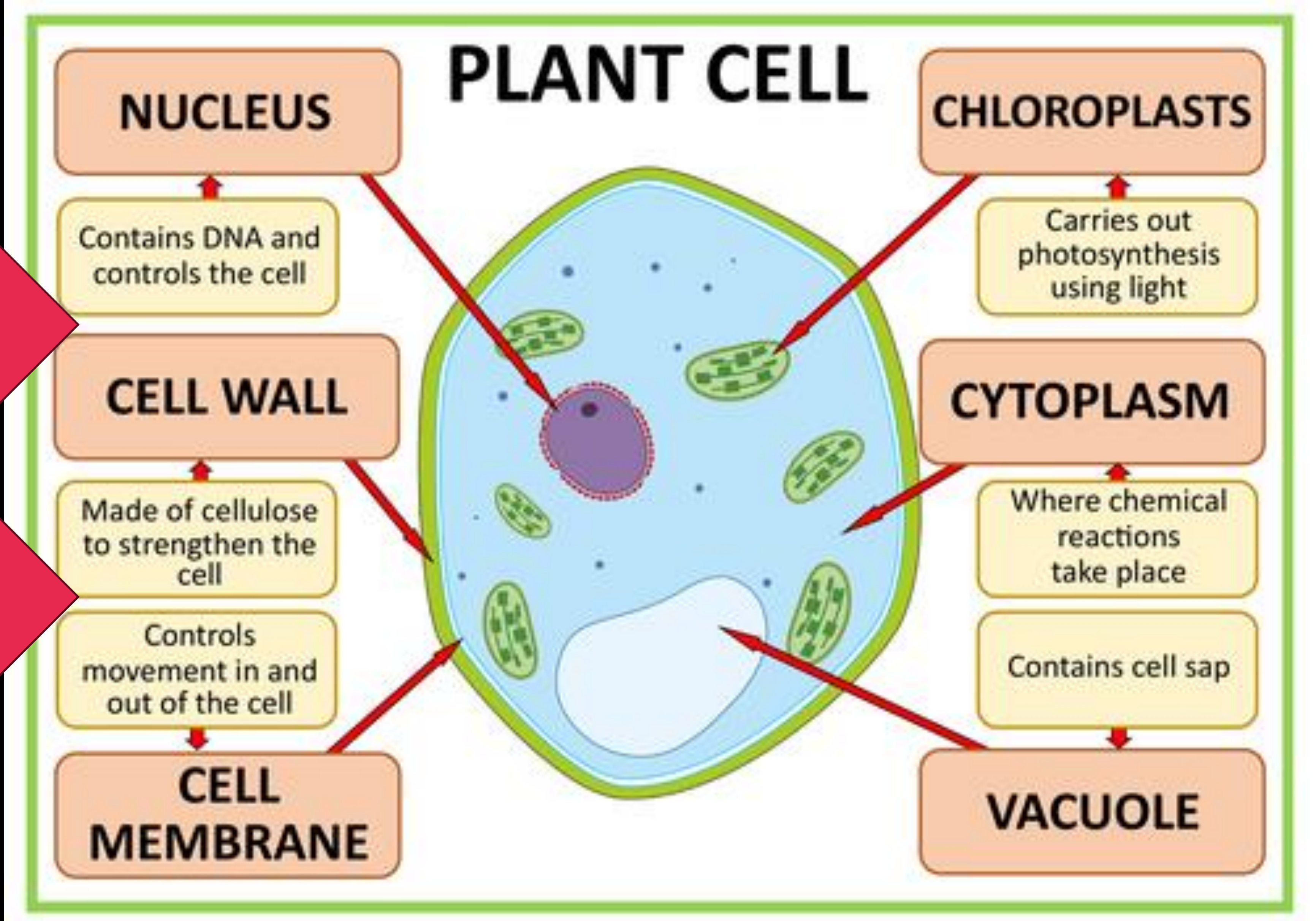
ME AS AN ARTIST

Designing and documenting ideas

Energy
Space
Life cycle
Reproduction
Organs
Oceans
Sustainability
Climate

Repetitive content

Essential terminology



- Look for opportunities to integrate content from other subjects or disciplines into biology lessons.
- Prioritize topics that have rich English language resources such as textbooks, articles, and multimedia materials to support learning.
- Topics that involve current research trends and advancements in biology can be beneficial for students to access news or contemporary English literature.

VOCABULARY
Diversity
Isolation
Evolution
Biota
Endemic
Species
Wildlife
Terrestrial

Flowering plant

Invertebrate
Vertebrate
Reptile
Lizard
Marsupial
Monotreme
Mammal

AUSTRALIA'S BIOLOGICAL DIVERSITY

The long isolation of Australia over much of the last 50 million years and its northward movement have led to the evolution of a distinct biota. Significant features of Australia's biological diversity include:

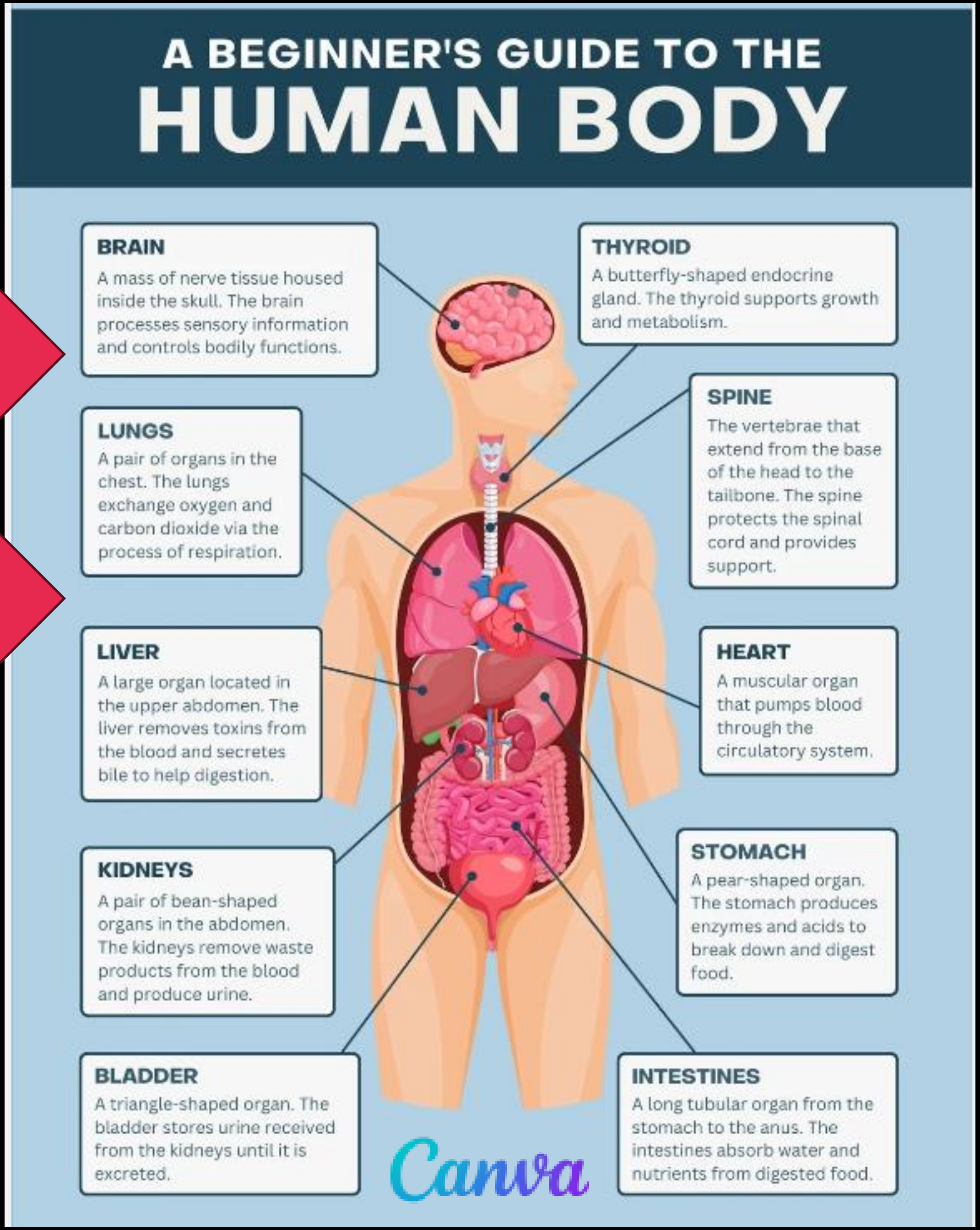
- A high percentage of endemic species (that is, they occur nowhere else):
  - over 80% of flowering plants
  - over 80% of land mammals
  - 88% of reptiles
  - 45% of birds
  - 92% of frogs
- Wildlife groups of great richness. Australia has an exceptional diversity of lizards in the arid zone, many ground orchids, and a total invertebrate fauna estimated at 200,000 species with more than 4,000 different species of ants alone. Marsupials and monotremes collectively account for about 56% of native terrestrial mammals in Australia.
- Wildlife of major evolutionary importance. For example, Australia has 12 of the 19 known families of primitive flowering plants, two of which occur nowhere else. Some species, such as the Queensland lungfish and peripatus, have remained relatively unchanged for hundreds of millions of years.

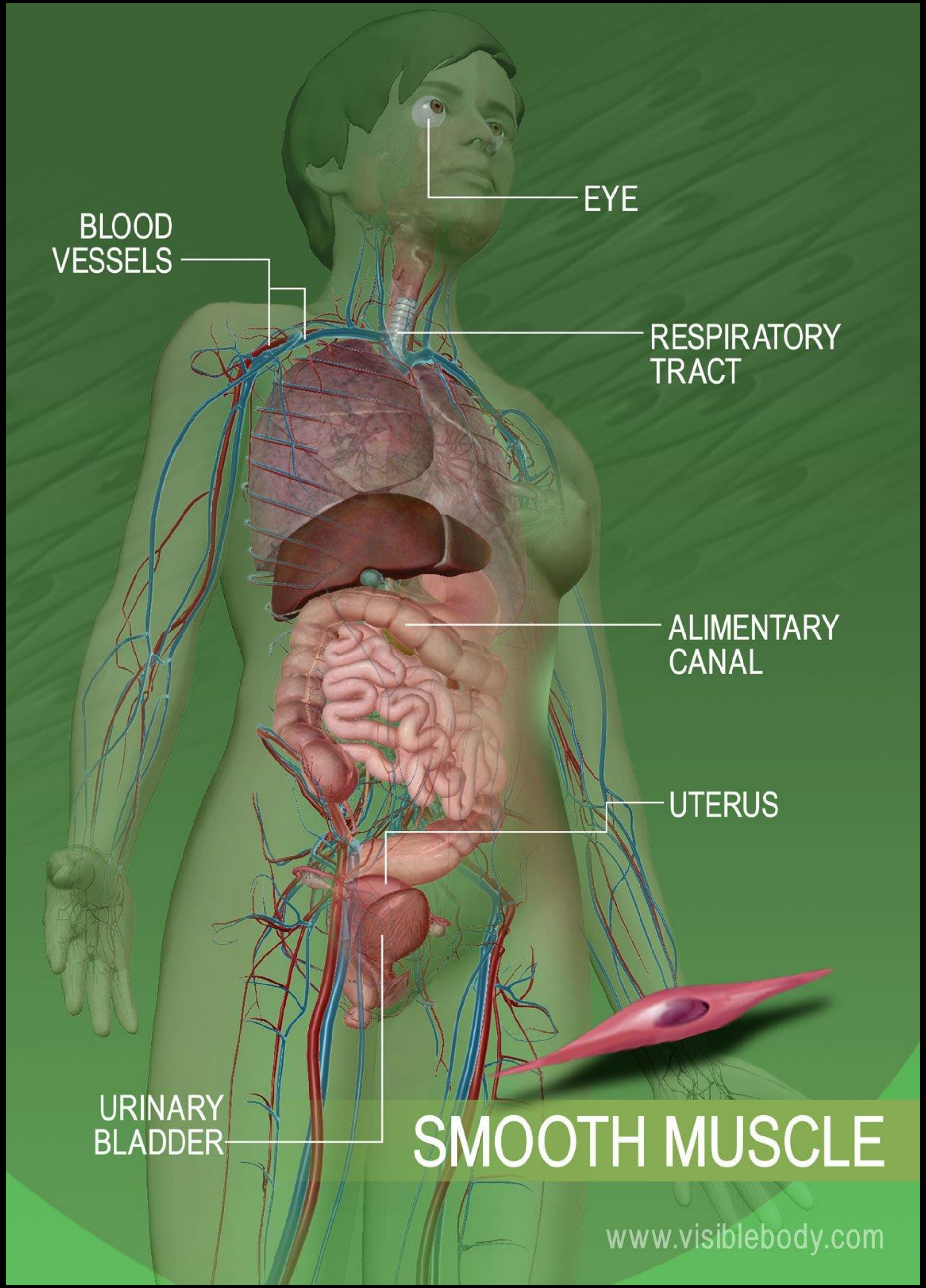
Integrative content

Figure 4. The short-beaked echidna is endemic to Australia. This animal—along with the platypus and three other species of echidnas—is one of the five surviving species of egg-laying mammals.

Core content

Support



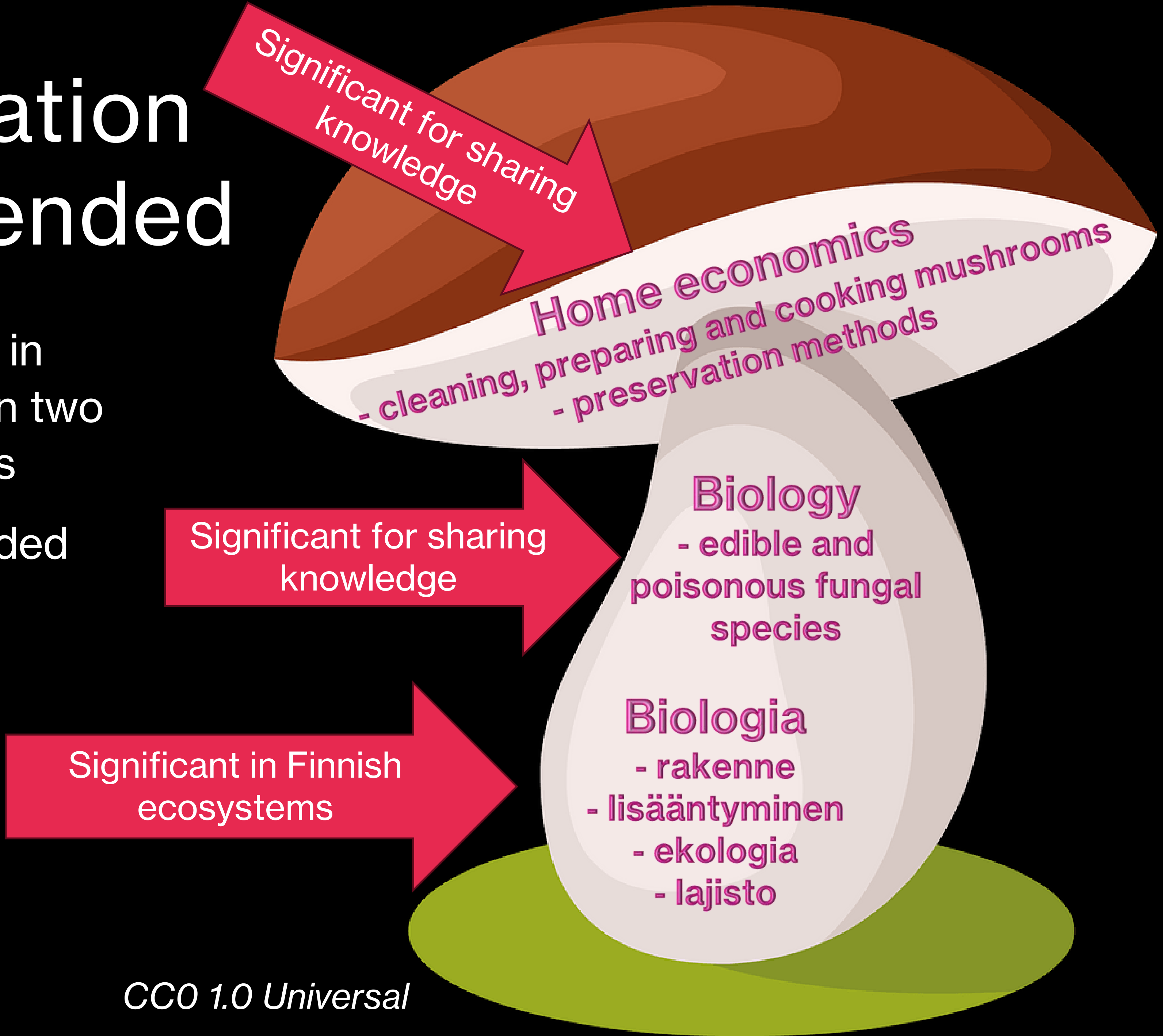


Topics for instruction in Finnish:

- Choose topics that are culturally relevant and resonate with Finnish students' everyday experiences and environment.
- Prioritize topics that are significant in Finnish ecosystems, biodiversity, and environmental conservation efforts to promote local awareness and engagement.
- Select topics that align with Finnish curriculum objectives and learning outcomes to ensure coherence and effectiveness in teaching.
- Topics that involve historical contributions of Finnish scientists or research conducted in Finland can enhance students' connection to the subject matter.

Collaboration recommended

- Teaching a topic in both languages in two different subjects
- Co-planning needed



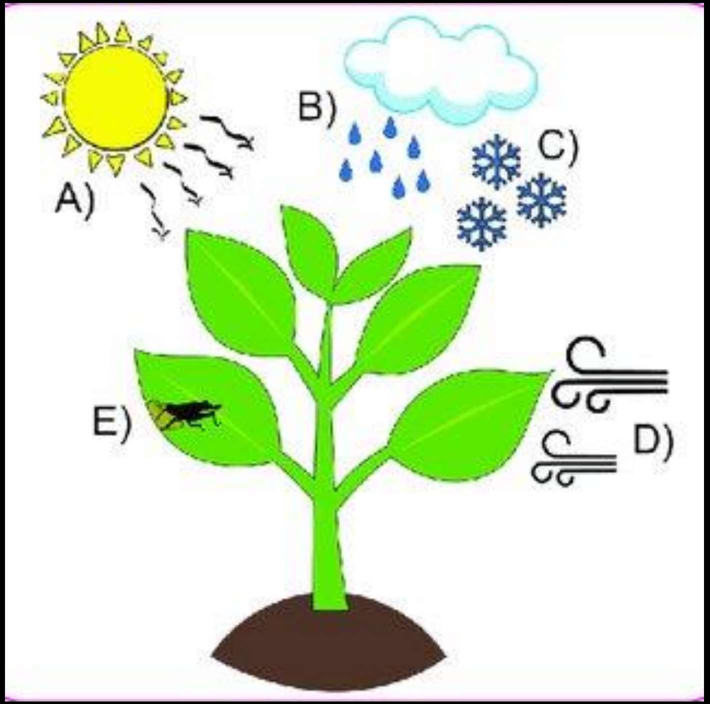
Avoid teaching this in English:

- Complex topics that require extensive background knowledge or technical vocabulary beyond students' proficiency level in English.
- Topics heavily reliant on nuanced linguistic understanding or cultural contexts that may pose comprehension challenges for students.
- Topics with limited availability of English language resources, making it difficult for students to access additional learning materials or support.

Scaffolding instruction in 2nd language:

- Provide bilingual glossaries or vocabulary lists to support students' understanding of key English terms related to biology.
- Use visual aids, diagrams, interactive simulations and illustrations to supplement English explanations and facilitate comprehension.
- Assess prior knowledge: Before revisiting repetitive content, assess students' prior knowledge and understanding to identify any gaps or misconceptions. Tailor instruction accordingly, providing review or reinforcement as needed before progressing to more advanced concepts.
- Incorporate cooperative learning activities, peer discussions, and group projects to encourage active participation and language practice.
- Offer additional support through pre- or after-school tutoring, online resources, or one-on-one sessions for students who require further assistance in understanding English content.

Energy
Life cycle
Reproduction
Organs
Sustainability
Climate



Photosynthesis
Growth
Seed germination
Plant anatomy
Biotic and abiotic factors and environmental stress

Encourage and promote:

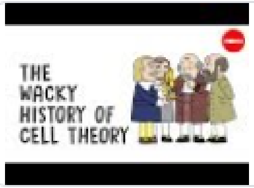
- Provide access to English resources: Introduce students to English-language biology books, magazines, websites, podcasts, and documentaries. Curate a list of resources that align with the curriculum and encourage students to explore topics of interest in English.
- Recommend English-language websites and apps: Direct students to online resources such as educational websites, apps, and platforms that offer biology-related content in English. Websites like Khan Academy, Lumen Learning or TED-Ed offer engaging videos and articles on various biology topics.

- Integrate English in Project-Based Learning: Design projects that require students to research, present, and communicate their findings in English. This could involve creating posters, presentations, or videos in English on specific biology topics.
- Promote interest and relevance: Emphasize the real-world applications of biology and highlight how English language proficiency can enhance students' understanding of global scientific advancements and research. Foster curiosity and enthusiasm for learning through engaging English-language content.

The cell theory

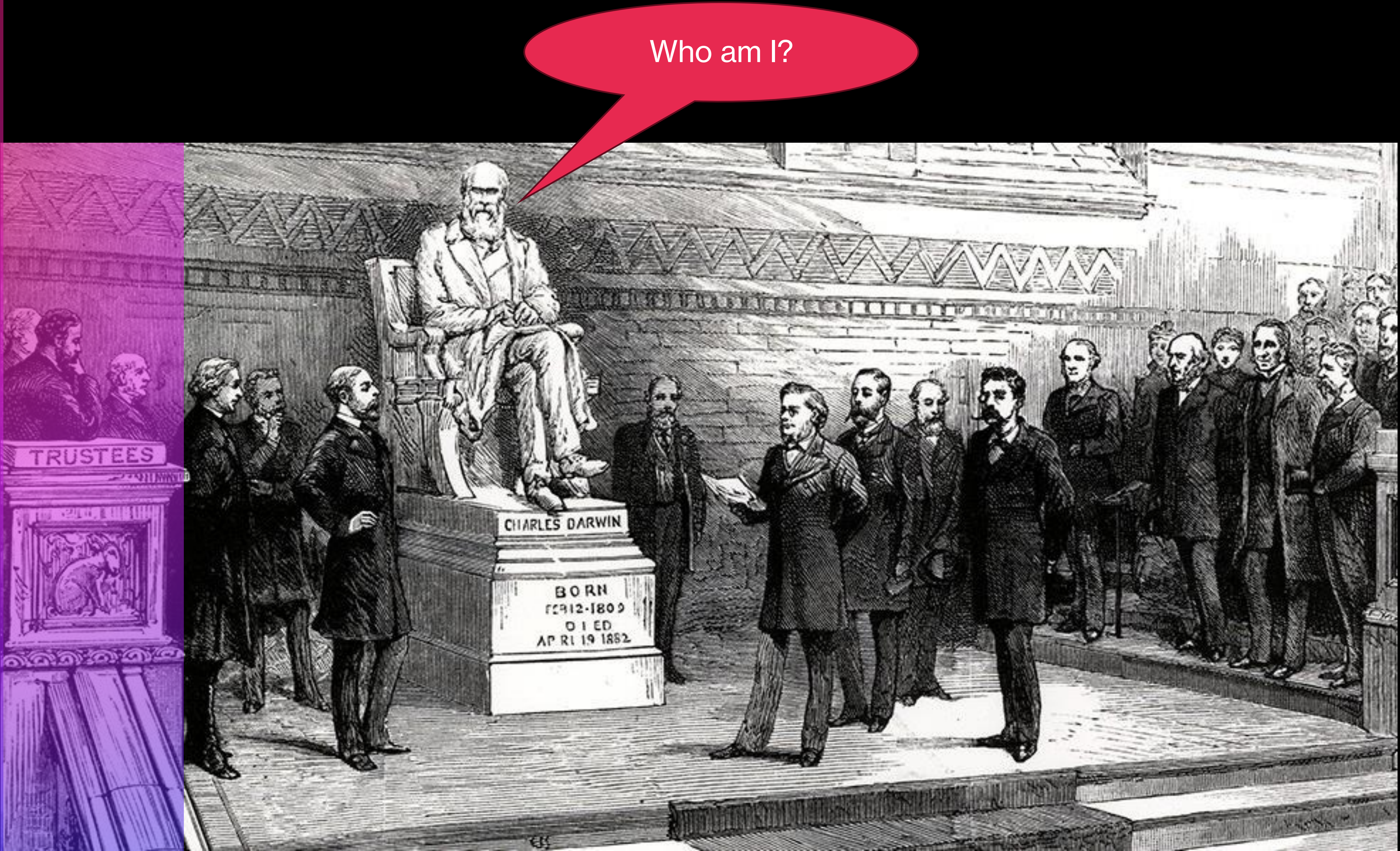
Anna Aaltonen • Apr 21, 2022 (Edited 9:27 PM)

1. Read all questions.
2. Watch the video.
3. Answer the questions. (You can pause the video.)



The wacky history of cell th...
YouTube video • 6 minutes

Bi7 Wacky-history-of-the-c...
PDF


Who am I?
TRUSTEES
CHARLES DARWIN
BORN
DIED

Project: Text a video

Science news

- https://www.sciencenews.org/topic/life

Sources

- https://courses.lumenlearning.com/suny-wmopen-biology2/
- https://www.khanacademy.org/
- https://ed.ted.com/
- https://www.nhm.ac.uk/schools.html
- https://evolution.berkeley.edu/teach-evolution/