Comparative Cultural Psychology

OpenEvo

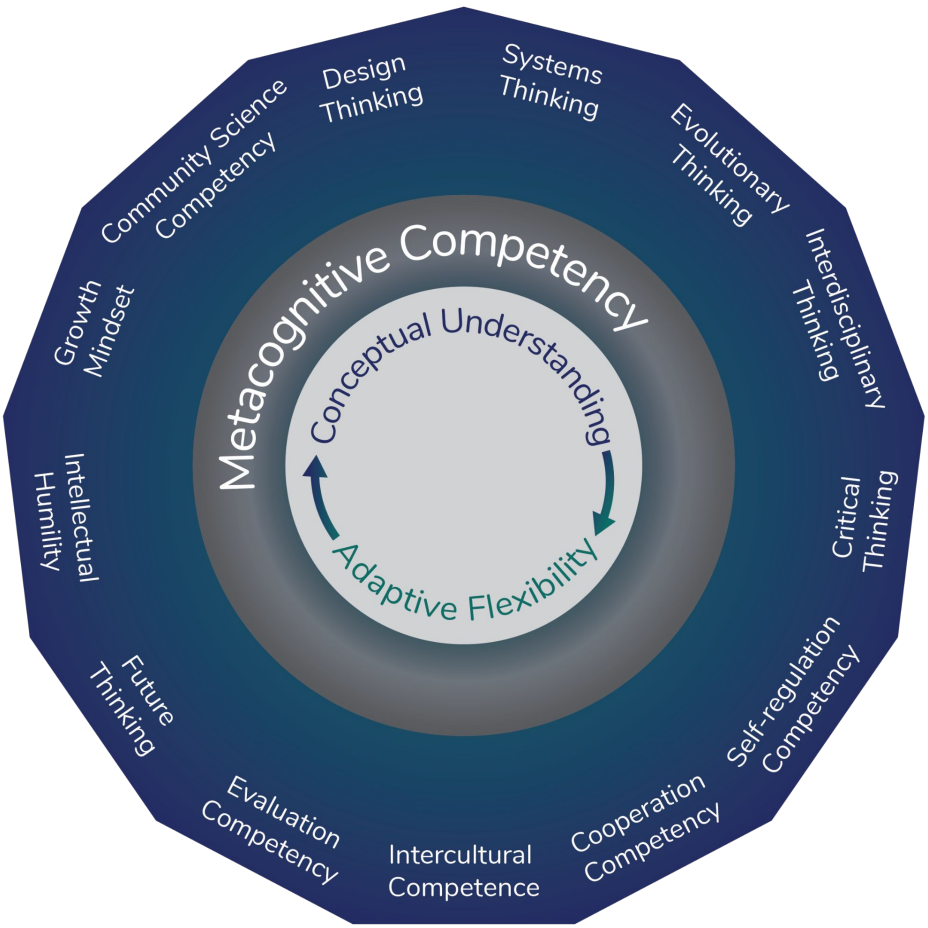
Learning Goals & Essential Questions

An overview for students, educators, and researchers

Learning Goals

With our educational design work, we aim to promote a range of interdependent **competencies and mindsets or attitudes** within students and teachers. These draw on and overlap with competency frameworks that have been developed within Education for Sustainable Development and similar movements of 21st century education[1].

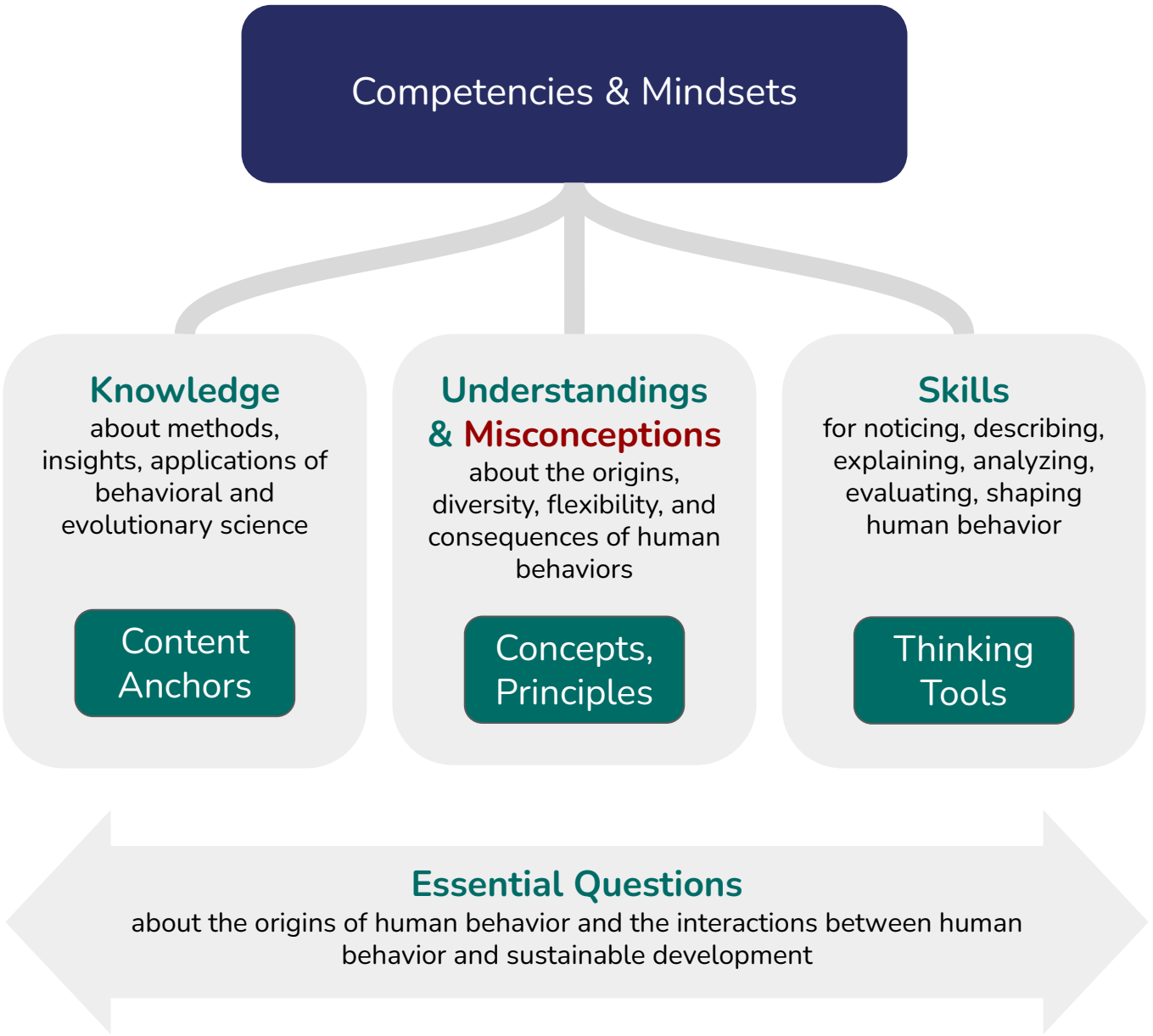
Our approach to the development of these competencies is centered around the development of **metacognitive competency**[2]. That is, we hypothesize that the **development and self-directed regulation of these competencies** - which are in themselves human behaviors - can be supported by, on the one hand, explicit and continuous reflection on our **understandings of human behavior**, and on the other hand, by practicing and experiencing **adaptive flexibility**, including through active involvement of learners in self-directed behavior change and community improvement efforts.



[1] OECD (2019); UNESCO (2017); Vare et al. (2020); WHO (1994); Wiek et al. (2011) [2] Hanisch & Eirdosh (2023)

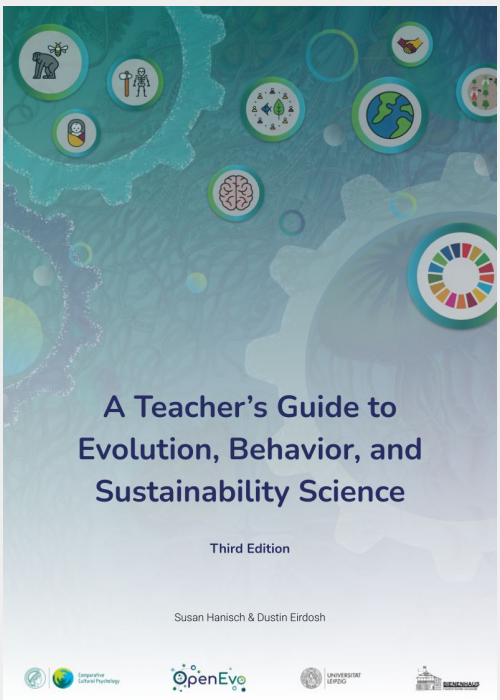
OpenEvo Learning Goals

We hypothesize that the development and self-directed regulation of these competencies - which are in themselves human behaviors - can be supported by, on the one hand, explicit and continuous reflection on our understandings of human behavior, and on the other hand, by practicing and experiencing adaptive flexibility, including through active involvement of learners in self-directed behavior change and community improvement efforts. They are thus supported by a set of further learning goals, including knowledge, understandings, and skills, as shown below.



In this document you will find our guidance for cross-cutting general knowledge (content anchors), enduring understandings as well as possible misconceptions, and selected essential questions that we have identified for supporting the development of core competencies.

These are not necessarily “set in stone” but are a first draft to serve as a compass for teachers and students to focus on. A variety of sub-goals can be formulated from these overarching learning goals for particular lessons and units, but these subgoals should relate to these higher-level goals. Similarly, a variety of more specific sub-questions can be formulated from overarching essential questions for particular lessons and units.



Our teacher’s guide and educational design concept

All of the content in this resource is based on our OpenEvo educational design concept, described in more detail on our website (http://openevo.eva.mpg.de) and within our Teacher’s Guide to Evolution, Behavior, and Sustainability Science.

Competencies & Mindsets

Metacognitive Competency

Metacognitive competency is the ability to be aware of, evaluate, flexibly reorganize, and regulate one's own thinking and behavior, including one's learning and one's understanding of concepts as well as one's behaviors related to important competencies and values. We regard metacognitive competency as a foundation for driving the development of all other competencies.

Systems Thinking

Systems thinking includes the abilities to recognize and understand causal relationships in complex systems on different levels, from self to the global level, and within different domains; to analyse complex systems and recognize dynamics such as multiple causality, non-linearity, feedback loops, delays, and emergence; and to deal with uncertainty.

Thinking tools such as as **causal maps** and **payoff matrices** as well as **computer models** of complex systems can help students develop systems thinking competency.

Evolutionary Thinking

Evolutionary thinking, similar to systems thinking, involves the abilities to understand and analyze change in populations and complex systems over various scales of time through the dynamics of decentralized processes of variation, selection, and information transmission or retention as well as the goal-directed behaviors of agents.

Thinking tools such as **causal maps**, **Tinbergen's questions** and analogy maps for the transfer of evolutionary processes across domains; as well as various Content Anchors can help students develop evolutionary thinking competency and apply evolutionary concepts to the analysis of change in ecosystems, self, culture, and society.

Interdisciplinary Thinking

Interdisciplinary thinking is the ability to apply, transfer, and combine knowledge, concepts, principles, skills, and methods of different disciplines to understand and solve novel problems.

Thinking tools such as **structure of knowledge diagrams and analogy maps,** as well other **pedagogical approaches** that foster conceptual thinking and transfer of learning, support students in the development of interdisciplinary thinking.

Competencies & Mindsets

Critical Thinking

Critical thinking is the ability and attitude to question norms, practices, and opinions; to reflect on one's own values, perceptions, biases, opinions, and actions.

Understanding human behaviors such as **fast and slow thinking**, **cognitive biases**, **moral intuitions**, **social norms**, and **imitation biases**, as well as the practice of **psychological flexibility** skills can contribute to the development of critical thinking skills.

Self-regulation Competency

Self-regulation competency includes the abilities to understand and cope flexibly with one's feelings, thoughts and desires; to be resilient in the face of adversity; to learn and grow throughout life; and to continually evaluate and further motivate one's actions towards goals and values.

This competency is closely related to the concept of **psychological flexibility** as advanced within the field of contextual behavioral science, and as such, concepts and methods developed by this field can support educational content and methods in the service of developing student self-regulation competency.

Thinking tools such as the **Noticing Tool,** exploring the **concepts of values**, **emotions**, **fast and slow thinking** and its relation to growth mindset, or the origins of **human language and symbolic thinking,** can support students in relating flexibly to their experiences and orienting their behaviors towards goals and values.

Cooperation Competency

Cooperation competency includes the abilities to reflect on and facilitate collaborative and participatory group cultures; to understand, respect, and relate to the needs, values, perspectives, and actions of others (empathy, perspective taking) across different socio-cultural backgrounds; to negotiate shared goals and values, and to deal with conflicts in a group.

Exploring the **evolution of cooperation** particularly in our species, using **Payoff matrices** to understand the role of social dilemmas in undermining cooperation, and applying **principles that tend to foster cooperation** in human groups can help students develop the understandings and skills underlying cooperation competency.

Competencies & Mindsets

Intercultural Competence

Intercultural competence includes the ability to be aware of one's own cultural context; to understand the influence of culture on human behavior, cognition, values, and beliefs; and to be sensitive to and interact appropriately with humans across different cultures.

Developing intercultural competence can be supported by exploring the **cultural diversity** of human behavior and cognition, and by exploring the complex causes of human behavior, in particular causes in the cultural evolutionary history.

Evaluation Competency

Evaluation competency includes the abilities to understand and reflect on the norms and values that underlie one's opinions and actions; and to negotiate shared values, principles, and goals in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.

The development of evaluation competency can be supported by **explicit reflections on the concept of "values"** and related behavioral concepts, as well as regular clarifications and reflections on personal and shared values, such as with the help of the **Noticing Tool.**

Future Thinking

Future thinking includes the abilities to reflect on, understand, and evaluate multiple future scenarios and their effects on behavior, wellbeing, and sustainability; to create and communicate one's own visions for the future and identify underlying values and assumptions; to develop goals and action plans for realizing future visions; and to deal with risks and changes flexibly.

The development of future thinking skills can be supported by students' understanding of the **role of future thinking (or "mental time travel") in human evolution and behavior,** its relation to morality, creating shared narratives and values, and in motivating individual and collective action.

Competencies & Mindsets

Intellectual Humility

Related to **critical thinking**, metacognitive competency and self-regulation competency, intellectual humility involves the abilities to be aware of the origins, changeability, and limits of one's opinions and knowledge and to be open to others' ideas and their values for advancing learning and understanding.

Exploring concepts such as **cognitive biases**, or using the **Noticing Tool** to become aware of and accept uncomfortable thoughts and feelings when facing uncertainty or encountering other ideas, can help students develop intellectual humility.

Growth Mindset

Growth Mindset is an understanding of the human brain and of human knowledge and behaviors as modifiable and shaped by experience; an attitude and ability to learn and grow throughout life even in the face of failures and setbacks.

We regard the concepts of Growth Mindset vs. Fixed Mindset as developed in educational research (Dweck , 2012) as adjacent to concepts of psychological flexibility vs. psychological inflexibility as developed within the field of contextual behavioral science. As such, the development of Growth Mindset can be supported by methods developed for the promotion of psychological flexibility, such as mindfulness, openness to and acceptance of experiences, values clarification and committed action even in the face of uncomfortable experience.

Community Science Competency

Community Science competency includes the abilities to use scientific concepts, methods, workflows, practices as well as ethical standards with the aim to understand and improve one's own communities towards shared valued outcomes.

Our **Community Science Lab** supports students in acquiring and applying understandings and skills underlying Community Science Competency.

Design Thinking

Design thinking includes the understanding that innovation is an iterative and often collaborative process; as well as the abilities to analytically and creatively design solutions, tools, interventions etc. through iterative processes of context and needs assessments, ideation, prototyping, experimenting, evaluation, and redesign.

Knowledge

Students will know about the various methods, research questions, central insights, and applications of interdisciplinary behavioral sciences.

Students should get to know the research and improvement methods with which we can investigate the causes and consequences of human behaviors, including the effects of certain conditions and interventions on human wellbeing and sustainable development. The Content Anchors of our design concept integrate such methods, including comparisons with other species, developmental psychology, cross-cultural research, experiments and case studies of sustainable resource use.

Understandings

Students will understand that . . .

1 Our everyday behaviors and experiences have many causes, some of which go all the way back to their evolutionary origins.

Student should gain a deeper understanding of the complex causes of our behaviors, especially since rather simplistic notions about causes of behavior have pervaded our culture and folk theories - from genes, to intentions, to dispositions such as “that’s just the way he is/they are/I am”. Reflecting on and understanding the many causes of behaviors and their interactions will help students better understand and accept themselves, their fellow humans, and their world. It will also help students explore ways to shape behavior and change their world towards what they care about.

2 Humans have been shaped by biological and cultural evolution to have an elaborated capacity to cooperate and need for social belonging.

Students should understand that we humans are a highly cooperative species, especially since this notion might go against common cultural knowledge, which may be partly due to outdated conceptions of evolutionary theory and economics, or due to the ‘invisibility’ of everyday cooperation and overemphasis on violence, competition, and conflict in the media. Students should come to an understanding about why, how and under what proximate conditions we humans are able to cooperate, and express our prosocial motivations, so that they are equipped to use this knowledge to foster cooperation and a sense of belonging in the groups and communities they are a part of..

3 Our everyday behaviors can have many consequences, some of which may be intended or unintended, and some of which may expand into scales of distant time or space in the future.

Students should understand that consequences of behaviors go beyond the immediately observable and beyond the next moment. Particularly, consequences of behaviors can be emergent from complex social interactions, such that no individual intended the specific outcomes. Consequences and causes are also often linked in feedback loops, such that consequences can become new causes, and habits, norms or other behavioral and cultural structures might emerge and become more and more difficult to change .

4 The (cultural) evolution and development of human behavior is relevant to the sustainability dilemmas of today.

Students should understand that to address the sustainability challenges of our time and of the future, we can and should use insights about the human condition, about the complex causes and consequences of our behaviors, about our capacity for cooperation and cultural flexibility and about what humans need to thrive.

Addressed misconceptions

Because all learning is based on prior learning, it is also important and helpful to know what kinds of common **prior understandings** students might hold before the teaching takes place, and specifically which **misconceptions** of students we need to be aware of, make explicit and address.

Below are examples of relevant misconceptions that we have identified in our educational work or in the literature.

Phenomena in biology and society are predominantly caused by the intentions of single agents.

This misconception relates to Understanding 1. This is a recognized misconception in biology education, as variations of intentionality bias, attribution error or teleological reasoning. We aim to develop a notion of complex causality in students whereby many factors across levels of organization interact and can create emergent outcomes that no individual intended. Students should also have the opportunity to reflect on the fact that many of our behaviors, thoughts and other experiences appear without our "intention". Causal maps and Payoff matrices can be tools to help students develop an understanding of such complex causes and emergent outcomes.

Evolutionary theory implies that selfish behavior is always adaptive.

This misconception relates to Understanding 2. This is a misconception that probably stems from a notion that evolution means "the survival of the fittest" or is always and only about competition between individuals, or from conceptions of human behavior in economics (Homo oeconomicus). Students need to understand that evolution can also favor cooperation, and that this applies particularly to the evolutionary history, present and future of our species. Students need to understand what conditions and mechanisms favor this evolution of cooperation, and which conditions and mechanisms can lead to the breakdown of cooperation..

Today's sustainability problems tell us that humans are intrinsically worse equipped than other species for sharing resources and using them sustainably.

This misconception relates to Understandings 1-4. This is a misconception we encounter among students and teachers, which implies faulty understanding about the causes of today's sustainability problems, and a problematic notion about human nature. It is important for all humans to understand that we humans have an evolved ability and motivation to share resources with others and to cooperate towards a preferred future, that we have done so throughout our evolutionary history, and that we are in fact cognitively and emotionally more equipped to do so than our closest relatives in the animal kingdom. Rather then question our inherent ability for sustainable development compared to other species, students and teachers should learn to explore the conditions and mechanisms that allow these human abilities to develop and spread so we can use them for addressing challenges of sustainable development in the future.

Skills & Thinking Tools

Thinking tools are used across diverse lessons to develop the skills that evolutionary anthropologists, behavioral and sustainability scientists use in exploring the causes and consequences of human behavior, and the complex relationships in social-ecological systems.

Using these tools across content also promotes transfer of learning across themes in evolution, behavior, and sustainability science.

Tinbergen's Questions

Tinbergen's Questions can help organize complex causality of behaviors and other phenomena across time.

Analogy Mapping

Analogy mapping is a tool for thinking about similarities and differences between different concepts or phenomena.

Structures of Knowledge

Simple diagrams can help us map and understand the structures of knowledge in our world.

Causal Mapping

Causal mapping helps us reflect on the interdependent relationships between agents and entities within complex systems.

Payoff Matrices

Payoff matrices can help us analyze the behavioral strategies and possible outcomes in diverse situations across biology and society.

The Noticing Tool

The Noticing Tool helps us be aware of and interpret our experiences and behaviors in the present and to orient our behaviors towards valued living.

Skills & Thinking Tools

Students will be able to ...

1 ... use Tinbergen's questions as a tool to explore complex causality of human behavior.

Students should become familiar with the different questions that can be asked regarding the causality and variation of human behavior. Students should form a habit of asking questions about the role of evolutionary and cultural history, socio-economic context, an individual's development and experiences, and immediate circumstances in causing observed human behaviors, as well as the costs and benefits that humans might experience from a behavior in their circumstances. Tinbergen's Four questions are a helpful heuristic for this set of questions that can be made explicit to students.

2 ... construct causal maps to represent causal relationships between conditions, behaviors and other factors in the development of populations and social-ecological systems.

Causal maps are an effective tool used both in science and education to reflect on complex causality of various phenomena. Through the repeated use of causal maps in the classroom students can develop an intuitive understanding of otherwise abstract causal relationships, including feedback loops, delays and emergent outcomes.

3 ... represent and take perspective on the possible motivations and outcomes (costs and benefits) of human behaviors with the help of payoff matrices, and identify the scale of social interactions and possible social dilemmas.

Payoff matrices are an effective tool used in behavioral and evolutionary sciences to reflect on the (possible) proximate causes and emergent outcomes of behaviors in social interactions. Social interactions, particularly those that represent a dilemma between individual and collective interest, are at the center of our everyday experience and of problems of sustainable development. The concepts of social interactions and social dilemmas can be engaged through the use of payoff matrices.

4 ... analyze and compare phenomena (e.g. models, experiments, species, societal events, case studies, real world sustainability issues) by overarching processes and principles with the help of analogy maps.

Regular engagement with analogy mappings across content material helps train students' understanding of the nature of higher-level principles studied in models, experiments, or across case studies in biology and society. Analogy maps are therefore a great way to practice transfer of learning skills.

5 ... be mindful of their own experiences and behaviors in the present, interpret their functions, and orient their behaviors towards valued living in the future, with the help of tools such as the Noticing Tool.

Becoming mindful of the diversity of their inner and outer behaviors helps students link behavioral concepts to their own everyday experience. Using tools of behavioral science such as the Noticing Tool (also known as the ACT matrix) can help students in noticing and interpreting the functions of their behaviors in relation to their values and wellbeing.

Essential Questions

Essential questions are there to guide teachers and students in their teaching and learning throughout a unit spanning various lesson materials or even throughout their schooling. Good essential questions help students develop their understandings and encourage them to make connections between lesson contents and the real world, or to reflect on how to use their understandings in solving real-world problems. Essential questions can be used as prompts to get initial student ideas and for assessments of their learning. The following are higher-level questions that can be adapted to learning about particular human behavioral traits and contexts.

What are the causes and consequences of an observed behavior?

This question engages students in developing their broad understanding of causes and consequences of behavior. Adapt it to specific observed behaviors and specific types of causes or consequences in lessons.
Examples: Are humans born with a sense of fairness? How does our human sense of fairness develop? How does culture influence our sense of fairness? What motivates humans to share resources with others? Which conditions of this experiment made humans cooperate less?

What are the similarities and differences between humans and other species? Why do these differences and similarities exist?

These questions engage students in developing their understanding about evolutionary causes of human behavior as well as deeper conceptions about specific traits.
Examples: Are humans the only species that care about fairness? Are humans the only species that use and make tools? What is the difference between culture in humans and culture in other species? What is the difference between how humans cooperate and how other animals cooperate? Why are humans able to cooperate in these unique ways?

What are the similarities and differences between humans today and our ancestors? Why do these differences and similarities exist?

These questions engage students in developing their understanding about evolutionary and historic cultural causes of human behavior, and lets them reflect on potential challenges of mismatch.
Examples: How is the natural, social, and cultural environment that most humans live in today different from the environment that humans lived in throughout evolutionary history? How is education today different from how humans taught and learned throughout our evolutionary history? Why do we live and learn differently today, and what challenges and opportunities might this bring for well-being and sustainable development?

Essential Questions

What are the similarities and differences between all humans today, and why do these similarities and differences exist?

These questions engage students in developing their understanding of developmental and socio-cultural causes of human behavior, builds their sense of common humanity, empathy, perspective taking, and acceptance of diversity.
Examples: Do you think all humans care about fairness? Why, or why not? Why might humans across cultures behave differently in this experiment? Why might 2-year old children behave differently than 4-year old children in this experiment?

What are the similarities and differences in the conditions and observable behaviors of a behavioral experiment and the conditions and observable behaviors in the real world?

This question engages students in developing their abstract thinking and transfer skills, lets them reflect on the rationale behind specific behavioral experiments, and encourages them to critically assess the transferability of insights to other contexts. It also reinforces their understanding about how proximate factors influence human behaviors.
Example: How do the conditions and observable behaviors in the Public Goods Game relate to the challenges of addressing climate change?

What are the similarities and differences between different sustainability problems in the world and at different levels of society?

This question engages students in developing their understanding of the common and similar causes of various sustainability problems, often involving a number of human behavioral and cultural as well as ecological factors and interactions, and ways to address them.
Examples: What are the similarities and differences between the challenges of sustainable forest resource use in a small village and the challenge of global climate change? What are the similarities and differences between climate change and a global pandemic?

What are the similarities and differences in the evolution of species and the present and future evolution of humanity?

This question engages students in developing their understanding of core causal evolutionary processes that can be used to help explain, and ultimately shape, the changes they see in the world around them.
Examples: How are cultural traits transmitted? How do new behaviors and technologies come about? Why do unsustainable behaviors spread?

Essential Questions

What are important conditions for humans to cooperate towards common goals?

This question engages students in developing Understanding 2 (→ p. 32), that is, exploring the how, when, and why of human cooperation. This question represents an important research program in behavioral and evolutionary science that is explored through a variety of methods and can be revisited across content.

What research methods do evolutionary anthropologists and behavioral scientists use to understand human behavior?

This question engages students in developing their knowledge of specific research methods and what questions they allow us to answer about human behavior.

How do our behaviors impact the world today?

This question encourages students to link specific human traits and behavioral concepts to events in history or in the present, or to specific problems of human well-being and sustainable development, locally and globally.
Examples: Can you think of current events in society in which our human sense of fairness plays a role? How does the human tendency to imitate others affect the spread of sustainability-relevant behaviors? How do our cognitive biases relate to the spread of misinformation on social media?

How can we use our understanding about human evolution and behavior to shape our world towards a preferred future?

These questions provide opportunities for students to reflect on and discuss what we can do to deal with certain human traits in a way that does not lead to negative consequences for ourselves, others, and our environment; and how we can use our understanding about human behavior to address real-world challenges.
Examples: What can we do to deal with our tendency for ethnocentric thinking so that it will not have negative consequences for ourselves and society? What can we do as individuals, in the school, or as a community? How can we change people's motivation in our community to be more physically active? How can we use the human tendency to imitate others to promote the spread of sustainability-relevant behaviors? How can we use our understanding about the origins and diversity of our human sense of fairness to assure fair distribution of tasks and outcomes in our next project group work? How can we use our understanding about the human need for social belonging to increase human well-being in our community?

References

Dweck, C. S. (2012). Mindsets and human nature: Promoting change in the Middle East, the schoolyard, the racial divide, and willpower. The American Psychologist, 67(8), 614–622. https://doi.org/10.1037/a0029783

Hanisch, S. & Eirdosh, D. (2020). A Teacher's Guide to Evolution, Behavior, and Sustainability Science. 2nd Edition. GlobalESD. http://guide.GlobalESD.org

OECD (2019). OECD Future of Education and Skills 2030. OECD Learning Compass 2030. A Series of Concept Notes (p. 149). OECD. https://www.oecd.org/education/2030-project/contact/OECD_Learning_Compass_2030_Concept_Note_Series.pdf

UNESCO (2017). Education for Sustainable Development Goals Learning Objectives. UNESCO. https://www.unesco.de/sites/default/files/2018-08/unesco_education_for_sustainable_development_goals.pdf

Vare, P., Lausselet, N., & Rieckmann, M. (Eds.). (2020). Competences in Education for Sustainable Development. Critical Perspectives. Springer. https://doi.org/10.1007/978-3-030-91055-6

Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. Sustainability Science, 6(2), 203–218. https://doi.org/10.1007/s11625-011-0132-6

Cite as: Hanisch, S., & Eirdosh, D. (2022). OpenEvo Learning Goals. https://openevo.eva.mpg.de/labs/edl/design-concept/learning-goals/

This material was developed in collaboration with the department of Comparative Cultural Psychology at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany; the organization Prosocial World; the Biology Education working group at the Friedrich Schiller University Jena, Germany, and the University of Leipzig, Germany.