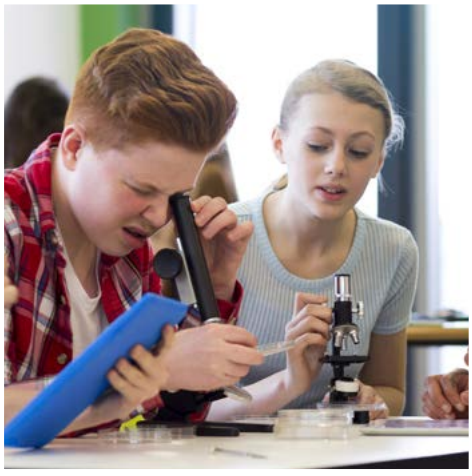
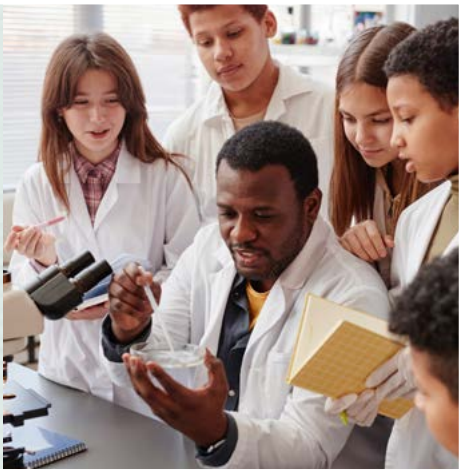
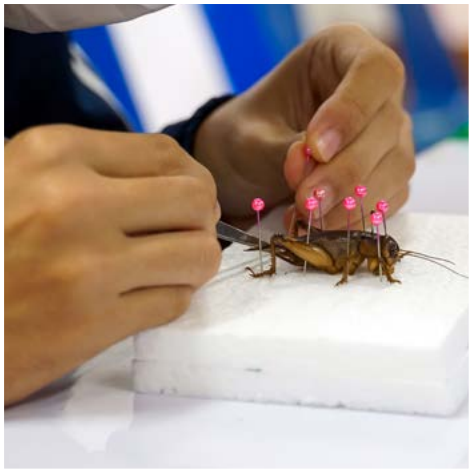
Utah State Board of Education | Teaching and Learning

Utah Guidelines for Responsible Use of Biological Materials in the Classroom







December 2025

This is a blank page.

Utah Guidelines for Responsible Use of BIOLOGICAL MATERIALS in the Classroom

Utah State Board of Education | Teaching and Learning

250 East 500 South
P.O. Box 144200
Salt Lake City, UT 84114-4200

Molly Hart, Ed.D.
State Superintendent
of Public Instruction

December 2025

For further information, please contact:

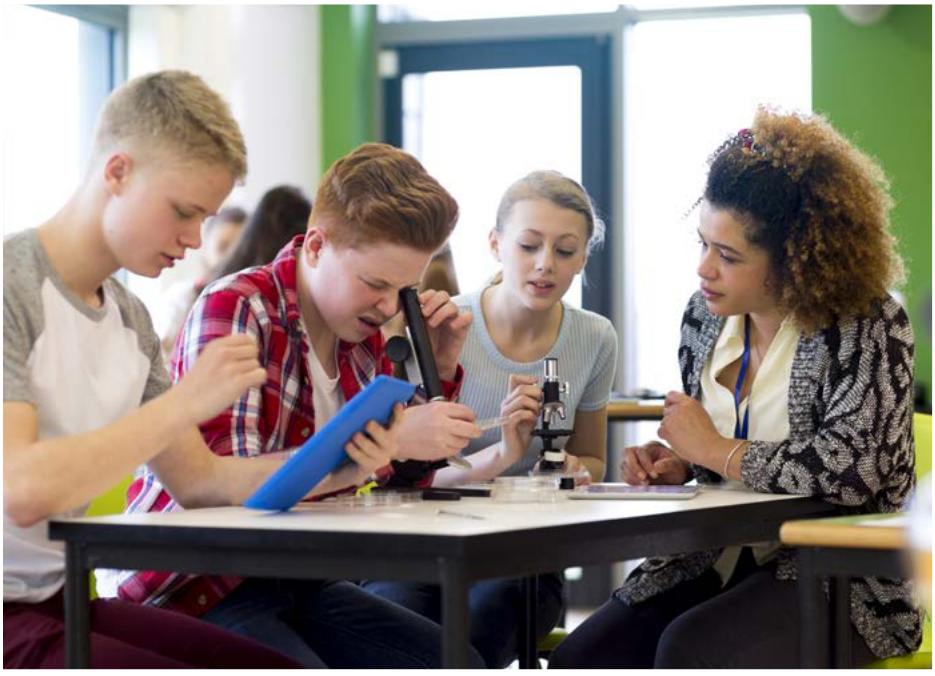
Milo Maughan
Secondary Science Education Specialist
Utah State Board of Education

Milo.maughan@schools.utah.gov

Utah Guidelines for Responsible Use of Biological Materials in the Classroom

A Framework for K–12 Science Education emphasizes the need for K–12 science education to focus on students building their science understanding by making sense of the world around them and moving beyond the simple memorization of facts. Using biological materials in the classroom allows students authentic opportunities to explore life science ideas, develop and use models, and explain observations with evidence, making science instruction deeper and more engaging.

This document provides guidelines intended to support educators in the safe and appropriate use of biological materials in educational settings. Individual local education agency (LEA) policies may vary in regard to the use of biological materials. Educators should always consult with and follow their LEA's specific policies and procedures in addition to these guidelines.



BIOLOGICAL MATERIALS IN THE SEEd GRADE BANDS

The Utah Science with Engineering Education (SEEd) Standards apply three-dimensional science teaching and learning into grade band progressions, as outlined in the Framework. General practices for the use of biological materials in these grade bands can ensure that the use of these materials is developmentally relevant for students.

Grades K–2 Developmentally appropriate instruction in grades K–2 emphasizes direct observation of the external features of living organisms. Focusing on external features, patterns, and behaviors sparks curiosity and provides foundational understanding.

Grades 3–5 In grades 3–5, students build on previous experiences by engaging in more structured macroscopic (large-scale) observations through the examination of living and preserved organisms. Students investigate the basic internal systems and external systems in greater detail than grades K–2. Students use models and both living and preserved non-human specimens from reputable sources to support deeper scientific thinking.

Grades 6–8 Middle school (6–8) builds on the previous macroscopic investigations with dissection of organism specimens using scissors as the cutting tool. Additionally, students are introduced to microscopic observation with prepared slides and models of cellular structures. Students focus on the safe handling of microorganisms and dissection tools, the ethical considerations of dissections, and emphasizing strict safety protocols.

Grades 9–12 High school (9–12) builds on micro- and macroscopic focus of organisms and incorporates dissection of preserved specimens, using scalpels and scissors as cutting tools, to understand different types of tissues and organs and how they work together. Students are taught to prioritize safety, ethical considerations, and alignment with learning standards. Advanced science and CTE courses include the potential use of human body fluids and tissues under strict safety guidelines.

OBSERVATION OF LIVING ORGANISMS

Observing living organisms in an educational setting may occur when aligned to the Utah SEEd Standards with clearly stated and developmentally appropriate instructional objectives. Observation serves as a valuable instructional mode, fostering skills, and appreciation for life. It is crucial to provide guidance that cultivates an understanding of and value for living organisms, including both plants and animals, as well as safe, non-human biological materials.

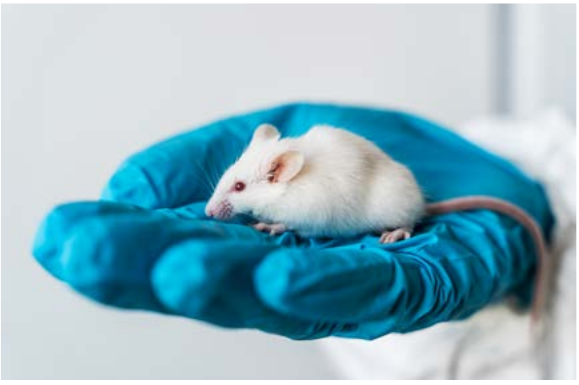
Teachers introducing animals, including class pets, must conduct research about the species prior to bringing them into the classroom to ensure they adhere to all guidelines for their ethical and legal acquisition, care, and eventual placement or release. This ensures humane treatment and compliance with instructional goals and regulations. Teachers should also consider the cultural traditions of their students to determine if the animal is appropriate. For example, some Native American cultures discourage the seeing, touching, or interacting with snakes. For wildlife, teachers must research state and federal rules on collection and possession, gaining specific knowledge of the species beforehand. Notably, Utah Law prohibits releasing to the wild or into public/private waters any plant or animal (e.g., butterflies and other insects, crayfish, fish, birds) without authorization from the Utah Division of Wildlife Resources. Links to state regulations can be found in the Appendix of this document. Additionally, educators must consult and follow their LEA-specific policies and procedures, including obtaining administrator approval.

Humane Treatment of Animals

Humane treatment and proper care of all organisms are paramount. This includes appropriate acquisition, providing a clean and comfortable environment with appropriate access to food and continuous access to water, and establishing a procedure for responsible and ethical care after classroom observation. Animals should be observed daily for their health and well-being. The following experiments with animals are unacceptable:

- Experiment that causes pain or discomfort to the organism.
- Behavioral studies involving punishment of animals.
- Induction of nutritional deficiencies or toxicities.
- Exposure of animals to microorganisms, ionizing radiation, cancer-producing agents or other harmful drugs or chemicals.

Class pets can enhance student engagement and support instruction in life science by providing opportunities for observation, responsibility, and care of living organisms. However, the decision to have a class pet must prioritize the health and safety of both students and animals. Educators must obtain administrator approval prior to acquiring a class pet and ensure compliance with all LEA policies regarding live animals in classrooms. Only animals that pose minimal risk to students, and that can be safely and humanely cared for in the classroom environment, should be considered. Plans must also be made for the pet's care on weekends, holidays, and after the school year ends.



Safety Precautions With Animals

Safety precautions are essential when working with any animals, including mammals, birds, reptiles, insects, spiders, amphibians, and fish. Teachers must instruct students on safe handling procedures and must have a written, approved plan to address bites, scratches, allergic reactions, or fears. The following recommendations will help reduce any animal-caused illnesses and diseases:

- All habitats, including tanks, cages, and enclosures, must be cleaned and disinfected regularly to ensure a healthy environment for both the animals and the students.
- Always wash hands thoroughly before and after handling an animal.
- Do not allow animals in food preparation areas or areas where food is consumed.
- Do not wash animals, their cages, or their dishes in a sink where food is prepared or where children wash their hands (a custodial sink may work for this).

  After a sink is used for the purpose mentioned above, clean and disinfect the sink thoroughly with a strong disinfectant approved by the LEA.
- Do not let animals freely roam about the classroom.

Disclaimer: Documented service animals are not considered class pets and are protected under the Americans with Disabilities Act (ADA). Their presence in the classroom must be accommodated in accordance with federal and state laws, regardless of classroom animal policies.

Hatching of Poultry

The hatching of poultry can provide an exciting way for students to observe animals. Prior to starting the incubation process, it is paramount to determine the final destination for the chicks after they hatch and to secure the necessary permission. Incubation itself is a scientific endeavor that necessitates adherence to established procedures concerning appropriate sourcing of eggs, temperature, humidity, and the turning of the eggs to ensure a higher rate of successful hatching. Once the chicks have hatched, it's crucial to follow proper care practices. This includes providing appropriate bedding, enrichment, food, and water, ensuring a clean environment, and preventing the spread of illness.

Furthermore, safety and ethical considerations are paramount when hatching chicks in a school environment. The high risk of diseases from handling baby chicks necessitates comprehensive education on safe and proper handling procedures. This includes the safety precautions and guidelines in the preceding section.

The Utah State University Extension provides valuable resources and fact sheets on hatching eggs and raising chicks, including tips on incubation and chick care.

Regarding School Visits With Animals

Organizations, such as zoos, museums, rehabilitation centers, aquariums, and animal shelters, provide outreach programs for the classroom. When at a school, these groups must follow all school policies. It is the responsibility of the classroom teacher to make visiting organizations aware of school and LEA policies relevant to their visit. Teachers must always remain in the classroom with the students during the visit and oversee that all policies are being followed. Effort should be made to counsel the students, prior to the animal's arrival, on appropriate behavior when interacting with animals for the benefit of both the animals and the students. Proper biosecurity measures such as hand washing and cleaning should also be instructed

BIOLOGICAL MATERIALS IN SCIENCE FAIRS

For students participating in school, LEA, and regional science fairs, students are expected to follow specific rules when using biological materials, like those established by the International Science and Engineering Fair (ISEF). Biological materials in science fair projects include vertebrate animals, Potentially Hazardous Biological Agents (PHBA), and human participants. These rules are in place to ensure the health and welfare of all involved, including the student researcher, human participants, vertebrate animals, and the environment, as well as adherence to federal regulations and safe laboratory practices. All projects that include one or more biological materials should be reviewed and approved by the appropriate personnel or committee before any experimentation or data collection begins. The appropriate personnel or committee will depend on which biological material is included and the grade level of the project.

Vertebrate animals include all nonhuman vertebrates (including fish) at hatching or birth, with a few exceptions (please contact your LEA or regional fair representative regarding exceptions). For projects involving vertebrate animals, students should develop a research plan that justifies the use of animals, explains how potential discomfort to the animals will be minimized, describes the methods and procedures, identifies the species and number of animals, and discusses proper care during and after the conclusion of the project, as well as final disposition (if appropriate). For elementary or middle school projects, a veterinarian needs to review and approve the plan. For high school projects, review and approval of the

plan will depend on whether the research is conducted at a school, home, or field site versus a regulated research institution (i.e., university or company): see ISEF Form 5A or 5B, respectively, and consult the full ISEF rules for more information. Please note that students are NOT permitted to perform euthanasia of vertebrate animals.

PHBA encompass a range of materials, including microorganisms (e.g., bacteria, viruses, fungi, cyanobacteria, parasites), recombinant DNA (rDNA) technologies, fresh or frozen tissues, blood or body fluids, and human or nonhuman primate cells. **Projects involving culturing of PHBA, even those considered low risk (i.e., BSL-1 organisms), are prohibited in a home environment for all students. This includes simple projects like mold on bread or fruit**. Specimens may be collected at home as long as they are immediately transported to an appropriate lab for the risk level. For projects including PHBAs, students should develop a research plan that includes details on the source of the PHBA, a risk assessment, safety precautions, disposal methods, and any training the student needs. For elementary and middle school projects, both a science teacher and a biological/biomedical scientist should review and approve the plan. For high school projects, a qualified scientist must review and approve the research plan, as well as a scientific review committee for projects conducted at school; ISEF Form 6A is required, as well as Form 6B for projects involving tissues or body fluids. Notably, certain biological materials, such as plant tissue, specific non-primate cell lines, and sterilized teeth, are listed as exempt from these PHBA rules, provided they are not known hazards. Projects requiring BSL 3 or BSL 4 research are not allowed.

Human participant studies include any project where the researcher collects data or specimens from a person through interaction or intervention, or the collection of identifiable private information. These include studies that collect surveys, questionnaires, or tests, or where the participant is involved in physical activity. For human participant studies, students should develop a research plan that includes an assessment of potential risk (both physical and mental) to the participants, describes methods and/or procedures, and includes consent/assent forms. All human participant studies involving minors (those under 18 years of age) must receive approval from the student participant and **written parental permission from a legal guardian**. For elementary and middle school projects, the research plan should be reviewed and approved by both a science teacher and a medical professional. High school projects must be reviewed and approved by an Institutional Review Board (IRB) prior to experimentation; ISEF Form 4 is required for projects not conducted at a university or company and additional forms may be required depending on the project. Please see the ISEF rules regarding human participants for prohibited and exempt studies.

For safety and ethical reasons, certain biological materials are generally not allowed for display at the project booth during the science fair. These prohibited items include:

- Living organisms, including plants

- Taxidermy specimens or parts
- Preserved vertebrate or invertebrate animals
- Human or animal food
- Human/animal parts or body fluids (for example, blood, urine)

Photographs or other images of these items are acceptable for display.

MICROORGANISMS IN THE CLASSROOM

Observation and experimentation with living microorganisms can provide students with valuable science learning opportunities not always available through other methods of instruction. However, these activities carry inherent risks, especially regarding the potential transmission of diseases and precautions should be followed to ensure a safe learning environment. As such, all microorganisms should be treated as biological hazards with the potential to spread human disease. Teachers must be knowledgeable about the proper care and handling of the microorganisms under study and the safety of their students.

While observing and experimenting with microorganisms, students need to be constantly educated and supervised on proper laboratory safety, behavior, and techniques, including putting on and taking off personal protective equipment (PPE). PPE, such as gloves, chemical resistant safety glasses or goggles, and a lab coat or apron, should be worn properly. Keep hands away from face, eyes, mouth, and body while using microorganisms. Food should never be prepared, stored, or consumed in the same space as microorganisms being used for classroom purposes.

Avoid culturing bacteria or fungi from random surfaces or students' bodies (e.g., oral swabs or spit), as this poses a high risk of growing harmful pathogens. Cultures obtained for classroom use should come from known sources, such as biological supply companies, and should be treated as potential pathogens.

Culturing, observing, and manipulating fungal cultures and samples must occur in a fume hood to draw out any spores and other airborne particles from the room. See the appendix for more documentation on working with microorganisms in the classroom.

CLASSROOM DISSECTIONS

Classroom dissection, involving observation and manipulation of animal specimens, serves as a valuable instructional tool in science education, offering students unique opportunities to develop skills of observation and comparison, discover the structures and processes of organisms, and appreciate the complexity of life. However, the appropriateness of dissection varies with student maturity levels. In grades K–5, the focus should primarily be on observation of living organisms, and dissections should not occur. For grades 6–8, teachers may use dissection, but it should be done only with dissection scissors instead of a scalpel. In grades 9–12, while observation remains important, dissection may utilize scalpels to make cuts and investigate internal structures of organs. Regardless of grade level, dissection activities must be based on carefully planned instructional objectives that are appropriate to the students' maturity level and are properly aligned to the SEEd Standards.

Acknowledging students' views and beliefs related to dissection is crucial, and teachers should be prepared to present a meaningful alternative for students who are uncomfortable participating. These alternatives can include computer simulations, images, graphic representations, models, or online resources. Guardian consent is recommended at least two weeks prior to the dissection, or with their disclosure documentation at the beginning of the school year. See the appendix for a sample guardian consent form.

Safety is paramount during dissection activities. Students should be properly trained in the safe use of laboratory tools like probes, scissors, scalpels, and PPE. Activities must be conducted in a clean and organized workspace. Appropriate PPE, such as gloves, chemical splash goggles, and aprons, should be available and used by everyone in the laboratory.

For safety and ethical reasons, it is recommended to use prepared specimens purchased from a reputable and reliable scientific supply company. While United States Department of Agriculture (USDA)-approved or Utah state-inspected facilities like butcher shops can be acceptable sources for fresh specimens, the use of salvaged specimens (e.g. roadkill) is not considered safe practice. All organisms, whether living or preserved, must be handled and disposed of humanely and with respect and in a manner that is legal, based on environmental and biosecurity considerations.

HUMAN FLUIDS AND TISSUES

Whenever human samples are used, guardian consent must be obtained before the samples are collected. Teachers shall distribute a guardian consent form to guardians at least two weeks before the samples are collected or with their disclosure documentation at the beginning of the school year. See the appendix for a sample guardian consent form.

Using human body fluids and tissue products in advanced biology or health science classes can offer valuable learning experiences, but they also pose significant biological hazards due to the risk of disease transmission. For this reason, the use of human blood and fluids in standard classroom labs is generally not recommended. If used, strict safety protocols must be followed: all human samples should be treated as potentially infectious, PPE must be worn, and safe lab conditions must be ensured. Samples of unknown origin or those collected from students, on or off campus, must be avoided. If a reasonable level of safety cannot be guaranteed, substitute materials, simulations, or virtual labs should be used.

Professionally prepared slides of human tissues are considered safe to be used in classrooms.

CAREER AND TECHNICAL EDUCATION

Specialized Career and Technical Education (CTE) programs that require state or national licensure, certification, registration and/or endorsement may utilize biological tissue, blood, and/or fluids in supervised laboratory activities to meet program requirements.

CTE programs currently include:

- Biotechnology
- Dental Assisting
- Emergency Medical Technician
- Medical Assisting
- Medical Forensics
- Nurse Assisting
- Surgical Technology
- Clinical Laboratory Science
- Phlebotomy
- Veterinary Assistant

Due to the nature of procedures performed by students in laboratory and clinical settings, Occupational Safety and Health Administration (OSHA) guidelines;

specifically OSHA Rule 66:5317-5325 Occupational Exposure to Bloodborne Pathogens, Needlestick and Other Sharps Injuries; must be followed and appropriate vaccinations required. OSHA guidelines are located at www.osha.gov. Individual LEA policies may vary. Educators should always consult and follow their LEA's specific policies and procedures in addition to these guidelines.

APPENDIX A : **RESOURCES**

- A Framework for K-12 Science Education
- Utah Science and Engineering Education (SEEd) Standards
- R657-3a - Collection, importation, transportation and possession of animals
- R657-3b - Certification of registration — birds and mammals
- R657-3c - Certification of registration — fish, mollusks and crustaceans
- R657-53 - Amphibian and reptile collection, importation, transportation and possession
- Utah State University Extension - Baby Chicks and Embryology
- International Science Fair Rules
- Working With Microorganisms Safety Acknowledgment Form
- Tips for the Safer Handling of Microorganisms in the Science Laboratory
- Occupational Safety and Health Administration Website

APPENDIX B : **SAMPLE GUARDIAN CONSENT FORM**

Guardian Consent Form for Activity

Activity Name:
Date(s) of Planned Activity:
Name of Student:
Course:
Teacher(s):
School:
Telephone Number:

Dear Guardian,

Your child is invited to participate in the above-mentioned science activity as part of our class curriculum. This activity is designed to provide a valuable hands-on learning experience related to our current studies.

The activity will involve [*Briefly describe the activity, e.g., "dissection of a preserved specimen," "collecting cheek cell sample," "collecting blood samples."].*

Your child will be asked to *[Describe the student's role/actions, e.g., "observe and identify anatomical structures," "collect and analyze data," "make observations and collect samples."*].

The **estimated time** required for participation is [*Estimate time, e.g., "one class period."*].

While safety precautions will be strictly followed, **potential risks** associated with this activity may include [*List potential risks, e.g., "minor exposure to preservative chemicals (formalin or carosafe)," "small cuts from dissection tools."*].

The **potential benefits** of participating include [*List potential benefits, e.g., "gaining a deeper understanding of organismal structures," "developing scientific inquiry skills."*].

Students will receive **instruction** on safe handling of materials and equipment, and appropriate safety gear (like goggles and gloves) will be provided and required.

A meaningful alternative assignment involving [*Describe the alternative assignment, e.g., "computer simulations or anatomical models."*] are available for students who are uncomfortable participating.

Participation in this activity is completely voluntary. Your child is free to choose or pivot to the available alternative assignment without consequence. If you have any questions about this activity, please feel free to contact me at [*Teacher Phone/ Email*].

Please indicate your decision by indicating and signing below:

Select One:

- ☐ I **give permission** for my child to participate in the [*Activity Name*].
- ☐ I **do not give permission** for my child to participate in the [*Activity Name*]. I understand that an alternative assignment will be provided.

I have read the information above and understand the nature of this activity, including the potential risks and benefits. I have had the opportunity to ask questions.

Guardian Printed Name:

Guardian Signature:

Phone Number:	Date:

Please return this form by [*Date*].

Utah State Board of Education | Teaching and Learning

250 East 500 South
P.O. Box 144200
Salt Lake City, UT 84114-4200