NSF HERD Survey Activity Types

Research and Development (R&D)

R&D is creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture, and society – and to devise new applications of available knowledge. R&D covers three activities defined below – basic research, applied research, and experimental development.

Research and Development (R&D) Activity Types:

Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.

Applied research is original investigation undertaken in order to acquire new knowledge. It is directed primarily towards a specific, practical aim or objective.

Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

Examples:

Basic research: A researcher is studying the properties of human blood to determine what affects coagulation.

Applied research: A researcher is conducting research on how a new chicken pox vaccine affects blood coagulation.

Experimental development: A researcher is conducting clinical trials to test a newly developed chicken pox vaccine for young children.

Basic research: A researcher is studying the properties of molecules under various heat and cold conditions.

Applied research: A researcher is investigating the properties of particular substances under various heat and cold conditions with the objective of finding longer-lasting components for highway pavement.

Experimental development: A researcher is working with state transportation officials to conduct tests of a newly developed highway pavement under various types of heat and cold conditions.

Basic research: A researcher is studying the heart chambers of various fish species.

Applied research: A researcher is examining various levels of a toxic substance to determine the maximum safe level for fish in a stream.

Experimental development: A researcher has a contract with the U.S. government to design a new stream monitoring system that will incorporate the latest research findings on toxicity levels for fish.

Basic research: A researcher is studying the social dynamics between captives that are being illegally trafficked.

Applied research: A researcher is looking into the effects of human trafficking in developing nations.

Experimental development: A researcher is using past research results to design an international online alert system for human trafficking.

Basic research: A researcher is studying the factors that go into deciding compensation for higher level management in companies.

Applied research: A researcher is analyzing CEO compensation with stock performance of Fortune 500 companies to do determine if there is any relation.

Experimental development: A researcher is creating an educational program on human resource factors that influence stock performance for young companies.

Basic research: A researcher is studying how tax laws have developed over the years.

Applied research: A researcher is studying how changes in tax law have affected people in different socioeconomic classes

Experimental development: A researcher is working with government officials to develop new measures on how tax laws will impact constituents.

Basic research: A researcher is identifying causes of abnormalities in posture.

Applied research: A researcher is studying how different posture abnormalities can be treated with physical therapy.

Experimental development: A researcher is working with a hospital to diagnose and correct abnormalities in posture.

Basic research: A researcher is studying how the brain identifies and reacts to different musical patterns.

Applied research: A researcher is studying the impact of musical instrument instruction on the neuropsychological development of toddlers.

Experimental development: A researcher is using music as a way to communicate and teach mentally deficient toddlers.

Basic research: A researcher is reviewing a court ruling and the decision behind it.

Applied research: A researcher is studying how a court ruling affected a whole generation of people.

Experimental development: A researcher is developing a program to anticipate how different populations may be affected by future court rulings.

Basic research: A researcher is changing the curvature of the wood on a string instrument and how it impacts sound.

Applied research: A researcher is redesigning a wooden instrument so that it can better project sound.

Experimental development: A researcher is developing an undergraduate class to teach string wood instrument design and sound optimization techniques.

Basic research: A researcher is studying how archeological files have been historically maintained throughout time.

Applied research: A researcher is preserving newly found archeological files based on best practices as identified in previous research.

Experimental development: A researcher is developing a digital repository that will house and maintain archeological files from around the world.

Basic research: A researcher is investigating the effect of different types of manipulatives on the way first graders learn mathematical strategy by changing manipulatives and then measuring what students have learned through standardized instruments.

Applied research: A researcher is studying the implementation of a specific math curriculum to determine what teachers needed to know to implement the curriculum successfully.

Experimental development: A researcher is developing and testing software and support tools, based on fieldwork, to improve mathematics cognition for student special education.