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POOLkits: Applying Object Oriented Principles from Software Engineering to Physics Object Oriented Learning – Preliminary Concepts
THOMAS KASSEBAUM, Byrd Polar Research Center, GORDON AUBRECHT, Ohio State University — Object-oriented development depends upon the creation of generic pieces that can be built into more complex parts. In physics, we begin teaching basic principles and then develop more complex systems, a fertile environment to develop learning objects. Each learning object consists of observable quantities, such as the physical properties of a block of wood, and operators that act on the object, such as force. Additionally, each object can also include an assessment operator that evaluates the impact of the learning object on student comprehension. The physics object-oriented learning kits (POOLkits) will be developed to enhance student understanding of physics concepts, as well as, build a framework for developing a software object based on the physics concept. A POOLkit can be extended, similar to the concept of extending classes in object-oriented programming, as physics knowledge expands. The expectation for these POOLkits would be to provide physics students with a solid foundation in the first principles to be able to derive more complex formulae and have the understanding of the process with a secondary benefit of enhancing the object-oriented programming capabilities of physics students.

Gordon Aubrecht
Ohio State University

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