Teacher: Price

Date: 06262011

Subject / grade level:

Materials: AliceReferenceWorld

NC SCOS Essential Standards and Clarifying Objectives
PSc.1.1.1 Interpret all motion as relative to a selected reference point. Identify distance and displacement as a scalar-vector pair. Describe motion qualitatively and quantitatively in terms of an object’s change of position, distance traveled, and displacement.

Lesson objective(s): Students will be able to identify various frames of reference. Students will qualitatively and quantitatively describe motion observed from multiple reference points. Students will use height change and angular displacement to make predictions of meetings.

Differentiation strategies to meet diverse learner needs: Complexity of simulation to be modified as necessary.

ENGAGEMENT
- Describe how the teacher will capture students’ interest.
- Run simulation with various views
- What kind of questions should the students ask themselves after the engagement?
  What are the objects doing from my perspective? What are things doing from other perspectives

EXPLORATION
- Describe what hands-on/minds-on activities students will be doing.
  Students will change views during simulations to develop an understanding of the concept of frame of reference. Students will make quantitative estimates and measurements to predict position and motion to a set world view
- List “big idea” conceptual questions the teacher will use to encourage and/or focus students’ exploration
  Most questions will deal with guiding the students to see that motion can be broken down into vector components with respect to a given position.

EXPLANATION
- Student explanations should precede introduction of terms or explanations by the teacher. What questions or techniques will the teacher use to help students connect their exploration to the concept under examination?
  Where will subject be in a given moment? What will be the apparent motion from a different position?
- List higher order thinking questions which teachers will use to solicit student explanations and help them to justify their explanations.
  How can I use certain information to predict track and location of self and an object.

ELABORATION
- Describe how students will develop a more sophisticated understanding of the concept.
  Students will modify programming to change motion and make predictions of motion.
- What vocabulary will be introduced and how will it connect to students’ observations?
- How is this knowledge applied in our daily lives?
  Driving, meeting situations, echolocation, Air traffic controllers.

EVALUATION
- How will students demonstrate that they have achieved the lesson objective?
- Programming practicum, prediction, verbal explanation of motion elements
- This should be embedded throughout the lesson as well as at the end of the lesson