***Mission to Titan Materials***

**Part I - Getting Started - 20 Minutes**

After each team has assigned and reviewed the roles the **materials manager** can report to the **Supplies Center** to collect the team materials. Once the team has gathered the materials, they must first brainstorm their hypotheses- predictions of what the performance of the balls will be when dropped (simultaneously) from a horizontal plane or rolled (simultaneously) down the inclined plane.

The **recorder** needs to carefully chart the individual predictions of team members.

**Part II - Trials - 30 Minutes**

The **checker** makes sure that everyone has made their predictions and works with team members to prepare for the trials. It is important to make sure that the procedures are carried out correctly. Please make sure that you arrange your activity so you will not enter the space of another team. When in doubt, the **checker** will either consult with other teams or ask the session leader for clarification or direction.

After the original round of trials, teams are encouraged to use their problem solving skill to **identify variables** and to conduct trials with variations which satisfy their hypotheses. During this time, the **recorder** will work with team members in determining the outcomes (first and last balls to drop and shortest, longest roll) and recording these questions and ideas. The Data Sheet is used to record the outcomes of the trials, as well as the variables identified and any “researchable questions.”

**Part III - Team Processing - 60+ minutes**

When the trials are completed, the **materials manager** will return the supplies, pick-up and distribute the sheets on physics source information and the *Galileo’s Log.* The materials manager will also bring newsprint and markers to the team to create a visual or graphic that depicts their significant learning or ideas after having completed Easy Rollers. After team members have discussed the outcomes in light of the information they received they can **complete** their individual Logs.

**Part IV Group Sharing and Processing - 60 Minutes**

Here the entire group will review and discuss the information gathered by the **observers** about the social skills and intelligent behavior which they saw during the activity. The entire group will share common problems, variables and surprises which the activity included. Processing of the characteristics of constructivist learning practices, intelligent behaviors, and cooperative learning will focus not only on the content of the activity but implications for designing constructivist teaching activities or units. Materials developed to assist in the development of constructivist learning activities will be distributed at this time.

**Mission to Titan: A PBL and Collaborative Learning Activity**

*Before your team begins the activity, you will need to assign the following roles to member:*

**Materials Manager /Encourager**- the person who will drive the farthest to return   
 home today.

* Picks up, distributes, manages and returns materials.
* Is responsible for promoting a sense of encouragement within the group; maintains a positive "team spirit with phrases such as “great idea," "we work well together,” etc.

# Checker - the person to the right of the materials manager/encourager.

* Works with the team to assure smooth accomplishment of the objectives.
* Makes certain that all tasks are carried out correctly; Answers team questions; seeks out assistance when team requests it..

**Recorder** - the person to the right of the checker

* Is responsible for recording all the predictions and ideas which the group employs in completing the task, and reporting the outcomes to the whole group;

**Observer/Reporter** - the person to the right of the recorder.

* Is responsible for using the observation checklist to record when he/she sees the social behaviors as well as the intelligent behavior of perseverance occurring.
* Is responsible for organizing and providing leadership on the reporting of the outcomes to the whole group.

**Traveler** - optional the person to the right of the observer

* Is responsible for working with the checker as the group engages in trials and going to other groups to gain insight or new ideas for problem solving;

DESIGN AND IMPLEMENTATION OF A STUDENT-CENTERED

STEM-LEARNING CURRICULUM AND INSTRUCTION

Suggested Format:

1. What instructional practice would you like to replace, enhance, integrate? Why
2. What practice will you introduce or extend? How will this lead to

a student-centered classroom?

1. How will you develop and extend the new practice/strategy?
2. When do you expect you can introduce your new implementation?

Evaluation Plan:

1. How will you evaluate the new practice’s impact on?

1. Student acquisition of content knowledge?
2. Student social skills
3. Student “intelligent behaviors”
4. Overall learning climate in your classroom.

2. Indicate any data you will collect before and after the implementation or the types of student assessment tools you will use.