Kids in Micro-g Template Proposal Instructions 2010-2011

The proposal you submit will be used as procedures that are uplinked to the crewmembers onboard the International Space Station (ISS). Some additions may be required, such as required safety warnings, but the goal is to make this submission as close as possible to the final onboard procedure. Therefore, certain guidelines and standards need to be followed.

General Requirements:

- Submissions will be accepted **Thursday, October 21, 2010, through Wednesday, through 11:59pm CST, Wednesday, December 8, 2010.**
- The proposal should be submitted as a PDF-formatted document. Winning proposals will also be required to submit a Microsoft Word document.
- The margins should be set to 1" each on top, bottom, left, and right.
- The text should be black.
- The font should be 11-point Arial used throughout the proposal, except for the title.
- Each page of the proposal should be numbered and include the last name of the teacher/educator and school name.
- Each proposal must use the attached cover sheet and template.
- Experiment proposals should be limited to no more than 7 pages in length, including the cover page.
- All experiment proposals should include photographic documentation of the proposed experiment in its fully set-up configuration as part of the 7-page-total document length.
- No more than 10 proposal submissions, per educator, are permitted. Educators are encouraged to use the Kids in Micro-g evaluation rubric to select their submissions.
- Proposals may be submitted by educators on behalf of a single student or a group of students.
- All Kids in Micro-g participants will be asked to complete a NASA evaluation upon completion of the program.

All experiment proposals should be submitted via email to the following addresses: jsc-iss-payloads-helpline@mail.nasa.gov (Use "Kids in Micro-g Experiment Proposal" in the subject line).

Questions regarding the Kids in Micro-g experiment proposal submission process can be sent to the above email or postal mail addresses.

Winning experiment teams, once notified, will be required to submit a Microsoft Word version of the proposal to NASA along with a short video (no more than four minutes in length) demonstrating the experiment. Teleconferences will be held with the winning students to provide additional information on the NASA process during the month of February 2011.

By submitting the experiment proposal, the adult teacher/educator is certifying that all data submitted are accurate and original.

INSTRUCTIONS FOR COMPLETING THE EXPERIMENT PROPOSAL TEMPLATE

TITLE OF EXPERIMENT: Needs to be in bold, all UPPER CASE, and Arial 12-point font**.**

BACKGROUND: Describe the classroom connections and how this experiment complements what you are studying in school. Outline the connections to science, technology, engineering and/or mathematics. Also, describe the research that went into developing the experiment and why you or your team chose it to submit for execution onboard the International Space Station.

OBJECTIVE: The description of the experiment objective should be in paragraph form and no more than six lines.

HYPOTHESIS: Provide a brief synopsis of what happened in the classroom 1-g environment, and a brief synopsis of what will be the expected outcome in the microgravity environment on the International Space Station.

DURATION: Describe each of the following thee time factors.
Set-up time on the ground:
Experiments run time on the ground:
Take-down time on the ground:

MATERIALS: Please use terminology from the attached list provided. Quantity needed should be in parentheses. Below is an example of how to list the materials.

Gray Tape
Hygiene/Towel/Washcloth (Two)
Timer/Stopwatch
Mechanical Pencil w/o Lanyard
Fine Point Sharpie

STEP TITLES: Must be in all UPPER CASE and <u>underlined</u>.

PROCEDURE STEPS: This is a step-by step explanation of how to do the experiment and should be very detailed. Steps should be written in complete sentences and all punctuation should be used in accordance with the rules of grammar. Use a step number, followed by a period, a space, and the instruction. Steps can contain more than one action. Steps must be numbered sequentially, and aligned on the period in a single column. Sub-steps are to be numbered sequentially starting with 1.1 following the step number under each step title.

Example:

1. <u>EXPERIMENT SET-UP</u>

2. <u>EXPERIMENT EXECUTION</u>

3. <u>EXPERIMENT STOW</u>

STOW: All items called out in the materials list should be accounted for. They must either be stowed or trashed and listed under the EXPERIMENT STOW Step.

FIGURES AND TABLES: If applicable, center the item (Figure, Picture, or Table) above the appropriate step. Use the appropriate heading ("Figure", or "Table"), followed by a number and a concise description of the item. The heading should be centered below each item. The figure number should also be referenced in the step(s) that applies.

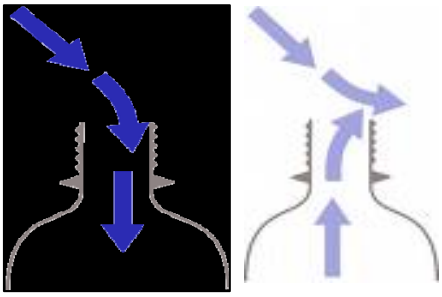

Figure 1: Blowing across the open bottle

DATA ANALYSIS: List specific questions and/or data points you would like to have answered while the experiment is being performed. ISS crewmembers will provide data analysis verbally on the video as it is being recorded.

CONCLUSIONS: Describe observed results from experiment runs conducted in the classroom and expected results from the experiment when conducted onboard the ISS.

(Note: See Proposal Sample Below)

Kids in Micro-g Sample Procedure

NEWTON'S SPACE OFFICE

BACKGROUND: We were curious about this because our teachers took a similar experiment of ours into the NASA micro-gravity plane last February. We used plastic spheres inside two lexan-glass plates with a "pinball plunger" on the bottom to give them a shake. The video showed the spheres floating separately and also clumping in a sort of wave motion. We are wondering a lot about this because we want to know if the M & Ms or Goldfish will separate, clump or go in waves. We think maybe it was just the plastic spheres that behaved this way in micro gravity or maybe the plastic spheres collected static. We would like to give this type of experiment a second trial in microgravity. We would like to see this with our own eyes!

OBJECTIVE: Observe the motion of M&Ms or Goldfish in a plastic bag in micro-gravity.

HYPOTHESIS: M & Ms or Goldfish will either float separately or clump together in a plastic 24x24 Ziplock Bag in micro-gravity even after shaking the 24x24 Ziplock Bag. We do not expect the M & Ms or Goldfish to bounce off each other.

DURATION:
Set-up time on the ground: 15 minutes
Experiments run time on the ground: 20 minutes
Take-down on the ground: 10 minutes

MATERIALS:
- 24x24 Ziplock Bag
- Nomex Grid (from EPO Kit)
- Kapton Tape
- M&M or Goldfish (50)
- Straw

1. <u>EXPERIMENT SET-UP</u>
   - 1.1 Place M&Ms or Goldfish (50) in a 24x24 Ziplock Bag.
   - 1.2 Close the 24x24 Ziplock leaving a small space open.
   - 1.3 Blowing through a straw inflate the 24x24 Ziplock Bag.
   - 1.4 Close the 24x24 Ziplock Bag.
   - 1.5 Secure the Nomex Grid to a locker using Kapton Tape.

2. <u>EXPERIMENT EXECUTION</u>
   - 2.1 Observe the M&Ms or Goldfish for one minute and describe the position of most of them.
   - 2.2 Remove the 24x24 Ziplock Bag and give it three quick shakes.
   - 2.3 Observe the M&Ms or Goldfish for one minute and describe the position of most of them.

3. <u>EXPERIMENT STOW</u>
   - 3.1 Remove the 24x24 Ziplock Bag from the locker.
   - 3.2 Trash M&Ms or Goldfish and straw.

3.3 Stow 24x24 Ziplock Bag in Kids in Micro-G CTB.
3.4 Stow Nomex Grid (to EPO Kit) and Kapton Tape.

Data Analysis:

- What did you see?
- Where did the M & Ms or Goldfish float in the 24x24 Ziplock Bag?
- Did the M & Ms or Goldfish clump or separate?
- Did the M & Ms or Goldfish move fast, slow or stop? Did they tumble? Did they hit and bounce off each other?
- Is there anything else you saw that you would like to tell us?
- Is there anything else you are still wondering about?

CONCLUSIONS: In our classroom experiments in 1g we saw the M & Ms or Goldfish stay on the bottom edge of the 24x24 Ziplock Bag for one minute of observation. After three, quick shakes of the 24x24 Ziplock Bag the M & Ms or Goldfish moved up against gravity and fall back down. There was just movement up and then down after shaking. The M & Ms or Goldfish always came back down to the bottom edge of the 24x24 Ziplock Bag. The M & Ms or Goldfish were clumped together on the bottom of the 24x24 Ziplock Bag, close together. There was no tumbling. The M & Ms or Goldfish did not hit each other and go the other way as far as we could tell; they all came down.