NASA's BEST Activities <u>Beginning Engineering</u>, <u>Science and Technology</u>

Curriculum for Engineering Clubs for Grades K-2, 3-5 & 6-

Electronic Professional Development Series Session 3 http://userpages.umbc.edu/~hoban/BEST

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Supported through NASA Exploration Systems Mission Directorate

Today's Session

- What really goes on at NASA:
 - Video: "Entry, Descent, Landing: Six Minutes of Terror"

• Review of last session:

- EDP Step 2: Imagine
- EDP Step 3: Plan
 - Share drawings
- EDP: Create
- EDP: Experiment



Materials required for today's session may be found on the web at http://userpages.umbc.edu/~hoban/BEST

Life at NASA

- Earth and space science missions comprise many components that must work together
 - Before the mission, and during the mission
 - Refer to activities 6 & 7
- NASA missions take teamwork
 - Should be emphasized during the clubs
- NASA attacks difficult problems
 - Studying the Earth from space
 - Going to the Moon and Mars





"We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win..."



JFK, Rice University, September 12, 1962



Adventures at NASA

- President Kennedy was talking about going to the Moon.
- See the video to learn about how scientists prepared to send the rovers, Spirit and Opportunity, to Mars!



UMBC

http://userpages.umbc.edu/ePD/videos/edl.mov



Review: EDP Imagine & Plan

- Imagine: NO BAD IDEAS!
- <u>Plan</u>
 - Transforming *imaginings* into a plan
 - Time to get ideas on paper may have to change from pure *imaginings* to something doable
 - Plan with available materials in mind
- From week-to-week, share sketching job so everyone gets a chance



Engineering Design Process: Create Video 5: Create http://userpages.umbc.edu/~hoban/BEST/ePD/videos/5-create_caption.mov

 Keep in mind that although the video talks about launching the satellite (Activity 2), today you will be building the satellite from Activity 1. You will be launching it for homework!



Pop-Quiz!

• What were some of the things to keep in mind during this phase?

- Review design specifications
- Now its your turn to CREATE. Can you stick to your plan?



Engineering Design Process: Experiment



- Measurement is critical
 - Emphasize...Don't skip it!
- Engineering vs "Arts-n-Crafts"
- Even younger grades can do analysis with help



Experiment video

• Experiment Video:

http://userpages.umbc.edu/~hoban/BEST/ePD/videos/6-experiment_caption.mov



Pop Quiz again!

- How many variables are the students testing at one time?
- How are the students able to "see" change in their experiments?
- What question should students be asking themselves after they experiment?





Next Session



- Do your "launch" for homework, and conduct the *Experiment* step
- Email your experimental results and pictures to

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NASA's BEST Activities Beginning Engineering, Science and Technology

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