8:00-8:15
Welcome, Introductions, Goals for the Symposium

Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center
Monica Trevathan, NASA Education Specialist, NASA Johnson Space Center
Dr. Steven Platts, Research Scientist, NASA Johnson Space Center Cardiovascular Laboratory
Dr. Scott Smith, Manager, Nutritional Biochemistry Laboratory, NASA Johnson Space Center
Al Byers, Director Professional Programs and e-Learning, NSTA
Mark Bosveld, Program Manager, NSTA
Flavio Mendez, Symposia Series Program Manager, NSTA
- College Credit Forms
- Pre-Evaluation Forms
- Goals for the Day

8:15-8:20
Opening Activity: Take Me Out to the Ballgame
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center

8:20-8:30
Big Picture Overview
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center

8:30—9:05
A Walk Through The Heart
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center
Monica Trevathan, NASA Education Specialist, NASA Johnson Space Center
Learning Outcomes:
- Explain (model) the structure and function of the cardiovascular system.

Resting and Active Heart Rates
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center
Monica Trevathan, NASA Education Specialist, NASA Johnson Space Center
Learning Outcomes:
- Explain (model) the structure and function of the cardiovascular system.
- Perform and describe hands-on activities relating to the cardiovascular system on Earth.
9:05—9:40
**The Cardiovascular System in Space**
Dr. Steven Platts, Research Scientist, NASA Johnson Space Center Cardiovascular Laboratory
Learning Outcomes:
- Summarize the major effects of space travel on the cardiovascular system.
- Identify at least two known countermeasures to the negative effect of space travel on the cardiovascular system.

9:40—10:00
**Measuring Leg Volume**
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center
Monica Trevathan, NASA Education Specialist, NASA Johnson Space Center
Learning Outcomes:
- Sequence the major effects of space travel on the cardiovascular system.
- Perform and describe hands-on activities relating to the cardiovascular system in space.

10:00—10:15
**Break**

10:15—10:35
**Muscle and Bone on Earth: Good Stress**
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center
Monica Trevathan, NASA Education Specialist, NASA Johnson Space Center
Learning Outcomes:
- Experience then relay in descriptive writing the effects of stress (exercise) on hand muscles.
- Define muscle strength and stamina and describe in writing how good stress (exercise) will increase both.

10:35—11:05
**Muscle and Bone in Space**
Dr. Scott Smith, Manager, Nutritional Biochemistry Laboratory, NASA Johnson Space Center
Learning Outcomes:
- List at least 2 of the major effects of space travel on muscle and bone.
- Identify and describe at least two known countermeasures to the negative effect of space travel on the muscle and bone.

11:05—11:30
**Building Blocks and Decalcified Bone**
Julia Bulkowski, NASA Education Specialist, NASA Ames Research Center
Lisa Neasbitt, NASA Education Specialist, NASA Johnson Space Center
Monica Trevathan, NASA Education Specialist, NASA Johnson Space Center
Learning Outcomes:
- Analyze current diet for the nutritional needs of healthy bone.
- Write a meal plan for a day illustrating good food choices, especially in terms of calcium.
- Compare structure of a normal bone versus a decalcified bone using magnifying lenses and microscopes and list at least three differences.

11:30—12:00
**Post-evaluation form, Perception Feedback Survey**
**Raffle for Telescope and prizes!!**
Standards Addressed:

Science

Content Standard C:
- Structure and function in living systems
  - Living Systems at all levels of organization demonstrate the complementary nature of structure and function
  - The Human organism has systems for digestion, respiration, circulation, excretion, movement, control and coordination, and for protection from disease. These systems interact with one another.
- Regulation and behavior
  - All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing environment.
  - Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required to survive.
  - An organism's behavior evolves through adaptation to its environment.
- Diversity and adaptations of organisms
  - Biological adaptations include changes in structures, behaviors, or physiology that enhance survival in a particular environment.

Content Standard F:
- Personal Health
  - Regular exercise is important to the maintenance and improvement of health.
  - Food provides energy and nutrients for growth and development. Nutrition requirements vary with body weight, age, sex, activity, and body functioning

Math
- Data Analysis & Probability
- Use mathematical models to represent and understand quantitative relationships
- Three-dimensional object analysis & volume calculations
- Statistics and data analysis

Health
- Explain how health is influenced by the interaction of body systems
- Analyze how environment and personal health are interrelated
- Demonstrate the ability to use resources from home, school, and community that provide valid health information