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NASA Ames 1999 Action Plan

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Nebraska Action Plan
NASA Ames New Rural Team 1999

Mission Statement: The Nebraska Team will communicate the breadth of NASA’s teaching resources to the administration, teachers, parents, students, and tribal members and implement them where appropriate.

Performance Objectives

1. Inform teachers and the community of NASA’s resources
2. Instruct the students in appropriate areas of science using NASA’s resources
3. Use NASA’s resources to motivate the students in areas of technology, mathematics and science
4. Inform students of different career opportunities in math and science

Individual Plan

1. All of the team members will contact their superintendent for permission to have the workshop
2. Donna Cain will contact the sponsor for funds for the informational packets
3. Crystal Klein will secure the materials for the packets
4. Wanda Henke will contact AESP (aeronautics educational space project) for a presentation to the teachers and students
5. Michelle Richling will make arrangements to have a team patch computerized

Relationship to NASA: The team will incorporate NASA materials, web sites, professionals, and paraprofessional personnel into the school system and community team plans.

1. Compile a packet containing web site, e-mail addresses, pictures, software, and a list of personal contacts
2. Distribute and present NASA’s resources via the above packets to the staff
3. Schedule an AESP workshop for the staff and a presentation for students
4. Present team results to NASA at the national NSTA conference in Orlando, Florida, in April 2000

Time Line: August 1999 through December 1999

Assessment:

1. Survey teachers for a response to the NASA resource packet
2. Assess the number of packets distributed
Action Plan: Donna Cain, Winnebago Public School, Winnebago, NE

The goal is to motivate the students to achieve the following objectives:

1. Integrate the Native American culture with the standardized sciences.
2. Will compare the Native American legends to the applied scientific method
3. Write conclusions from observations
4. Apply conclusions to their daily lives
5. Will utilize the NASA units and
6. Will integrate (write) Native American legends to correlate with the NASA units

(Below are a few examples how I might apply NASA’s units)

1. Globe (cloud watch) will help the students connect science to real life. The students will also learn to measure different dynamics of the environment (atmosphere, soil, water cycle).
2. With top-down or remote sensing the students will learn how to understand how objects look different from different perspectives. Then I can proceed to show the students the Native American perspective on the mother earth: (e.g. Ozone study, parcels and the magic wand). Quest will help the students with their career and goal setting.
3. Proceeding with the Native American mentors. The dynamic sun will be used to explain the influences of the earth’s climate. Each of these and more will make a great contribution to my classroom and meet their needs of fulfillment and thus motivate them to strive for higher education.
4. NASA materials (videos, handouts, computer programs, units)

Cultural Relevance

1. Number of packets distributed
2. Survey teacher response to the NASA resource packet
3. Student evaluation via paper and pencil testing, performance testing
4. Interviews,
5. Portfolios, performances, observing students, and transcript analysis

Relevant Math and Science Standards

1. National Science Standards:
   a. K-4 properties of objects and material, position and motion of objects, light, heat, electricity, and magnetism
distinguish between natural objects and objects made by humans, abilities of technological design,
   b. Characteristics of organisms, organisms, and environments
   c. Properties of earth materials, objects hi sky. Changes hi earth and sky abilities to
   d. Science as a human endeavor
2. National Mathematics Standards:
   a. K-4 mathematics as problem solving
   b. Mathematics as communication
   c. Mathematical connections
   d. Estimation
   e. Geometry and special sense
   f. Measurement
   g. Statistics and probability
   h. Fractions and decimals
   i. Patterns and relationships

Action Plan: Michelle Richling, Walthill Public School, Omaha Tribe, Walthill, NE

Our Galaxy Unit

Classroom Plan

The learner will:
1. Study the Earth
   a. Introduce to the concepts of remote sensing and false color imagery
   b. Sofia
2. Study the Moon
   a. Lunar prospector
   b. Moon landings
3. Study our Solar System
   a. Pioneer
   b. Voyager
4. Study the Sun
5. Look At Objects Outside Our Solar System
   a. SETI
   b. Hubble telescope
   c. Stars, super novas, black holes
6. Discuss and Explore the Possibility of Life on Other Planets
   a. Pathfinder
   b. Future mars missions
7. Discuss Human Exploration of Space
   a. Astronauts
   b. Living in space
   c. Neurolab mission
   d. Hubble telescope deep field, lesson package
   e. NASA=s great observatories, packet
   f. Lunar prospector mission, cd
8. NASA Mission Mathematics. Linking Aerospace and the NCTM Standards
   a. Lunar rocks
   b. Life sciences outreach resources packet
   c. Video (most requested NASA videos)
   d. NASA websites
   e. NASA=s Mars virtual exploration cd
   f. Remote sensing activities packet
   a. Video of June 28 teleconference
   b. Audio tape of planet sounds
   c. Space life express, magazine
   d. Posters
   e. Eating and sleeping in space, video
   f. NASA suited for space walking
   g. NASA micro-gravity
   h. NASA space, food, and nutrition

10. Mars: The Virtual Exploration Mission

**Teaching Strategies**

1. Cooperative Learning
2. Exploratory Learning
3. Videos
4. Computer CDs
5. Centers
6. Independent Learning
7. Cultural Mentors
8.

**Student Assessment**

1. Portfolios
2. Self
3. Peer
4. Written Tests
5. Informal Thinking

The following math and science standards will be covered in the *Our Galaxy* Unit.

**Relative Math and Science Standards**

The learner will:

1. Develop and apply a variety of strategies to solve problems
2. Model situations using oral, written, concrete, pictorial, and graphical methods
3. Use the skills of reading, listening, and viewing to interpret and evaluate mathematical ideas
4. Value the role of mathematics in culture and society
5. Develop and use order relations for whole numbers, fractions, and decimals
6. Compute with whole numbers, fractions, and decimals
7. Describe and represent relationships with tables and graphs
8. Analyze tables and graphs to identify properties and relationships
9. Systematically collect, organize and describe data
10. Make predictions that are based on experimental or theoretical probabilities
11. Estimate, make, and use measurements to describe and compare phenomena
Science Standards

The student will develop an understanding of:

1. Scientific inquiry
2. Properties and changes of properties in matter
3. Motions and forces
4. Transfer of energy
5. Structure of an earth system
6. Earth=s history
7. Earth in the solar system
8. Abilities of technological design
9. Science and technology
10. Natural hazards
11. Science as a human endeavor
12. Nature of science
13. History of science

A majority of the resources and materials used to complete the Our Galaxy unit will be provided by NASA.

Cultural Relevance: I will meet with Vida Stabler, Octa Keen, and Joyce Galvin when I return to Nebraska. They will help me generate ideas on how to intertwine the Omaha culture into the Our Galaxy unit. A majority of the resources and materials used to complete the Our Galaxy unit will be provided by NASA.

Time Line: I will begin to teach my unit, Our Galaxy, in September of 1999. I’m hoping to have the unit finished by December of 1999. At this time I am unable, however, to determine exactly where I will be in my unit come December. NASA has provided me with a number of different materials and resources and it is impossible at this time to determine how it will all come together.

Community Outreach: Folders will be put together that will include information such as: handouts, phone numbers and websites. I’m hoping that people will use these to explore the materials that NASA has to offer. Folders will be offered to the Walthill Public Library, the Omaha Tribal Building, and the Walthill extension office. The folders will include the same information as the folders that will be passed out to the teachers and faculty at Walthill Public School.

Action Plan: Crystal S. Klein: Omaha Nation Public School, Macy, NE

My personal action plan will be implemented in an advance science class for seniors and juniors. The class will be especially unique because it will be taught using the expeditionary learning/outward bound principles. This action plan will take place during the second and third quarters of the 1999-2000 school year. The second quarter=s focus will be the universe, astronomy, and astrobiology. The third quarter=s focus will be flight and space travel. A general outline follows for both quarters.

The Universe, Astronomy, and Astrobiology

1. Formation of the Universe
a. Scientific explanation
b. Omaha and other cultures’ explanation

2. Stars/Galaxies
a. Life of a star
b. Birth-nebula
c. Death—supernova

3. Dark Matter
a. Black Holes
b. Size and estimation—NASA packet
c. Electromagnetic Spectrum
d. Doppler Shift

4. Prism Activity
a. Telescopes
b. Light
c. Radio
d. Infrared
e. NASA Models
f. Constellations
g. Greek/roman
h. Native American
i. Other Cultures
j. Moon
k. Formation—four Theories
l. Phases

5. Exploration
a. Apollo Trips from Earth to the Moon Series
b. Lunar Prospector—CD
c. Moon rocks
d. Water on the moon

6. Astrobiology
a. SETI
c. Millennium Project
b. Mars/Exobiology
d. Where Might Life Be?

7. Why Do Planes Fly?
a. Bernoulli’s Principles
d. Model Airplanes
b. Lift
e. Paper
c. Thrust
f. Other Materials

8. Wind Tunnels
a. Use
c. Past
b. Advantages of Space Flight
d. Present

a. Why?

These outlines are general guidelines for the class. Certainly, as class progresses, modifications will be made and details will be added. Many more activities will also be included using the information and resources provided to me by this workshop as well as personal materials I have previously collected.
Relevance of National Science Education Standards: The following standards for grades 9-12 will be addressed during the course of this action plan.

1. Standards That Are Specific to Technique
   a. Systems, order, and organization
   b. Evidence, models, and explanation
   c. Change, constancy, and measurement
   d. Evolution and equilibrium
   e. Form and function
   f. Abilities necessary to do scientific inquiry
   g. Understanding scientific inquiry

2. Standards That Are Specific to Material Covered
   a. Structure and property of matter
   b. Motion and forces
   c. Conservation of energy and entropy
   d. Interaction of energy and matter
   e. Molecular basis of heredity
   f. Biological evolution
   g. Matter, energy, and organization in living systems
   a. Energy in earth system
   b. Origin and evolution of the earth system
   c. Origin and evolution of the universe
   d. Abilities of technological design
   e. Understanding about science and technology

3. Science As a Human Endeavor
   a. Nature of scientific knowledge
   b. Historical perspective
   c. Natural resources
   d. Natural and human induced hazards
   e. Science and technology in local, national, and global challenges

Teaching Strategies: I will be utilizing several different teaching strategies. First and foremost, I will be using the ten design principles of the expeditionary learning/outward bound program. This program focuses on raising students’ self-esteem and knowledge level through hands-on, community-based, service-oriented activities. I will also use more traditional techniques such as cooperative learning, discovery learning, lectures, videos, computer CDs, independent learning, and cultural mentors.

Student Assessment: Several different aspects of the students’ performance will be evaluated. These include attendance, daily journals, participation, portfolios, worksheets, activity summaries, completion of a community service project, tests and quizzes. The students will also be asked to evaluate themselves and their peers.

Materials and Relationship to NASA: This curriculum will be deeply dependent upon the vast resources provided to us by this workshop. I will also look to resources available to me on the
internet. I also have several resources from a previous class. Without the support from NASA for this workshop, this class would be nearly impossible to teach.

**Community Outreach:** The community is becoming increasingly important to the Omaha Nation public school. The students will be required to generate and implement a community service project that will benefit both them and the community that is related to the material being covered in class. I will also place an informational packet in the local college and the public school. These packets will be the same as the ones handed out to the faculty at Omaha Nation public school.

**Cultural Relevance:** I will be in close contact with my schools cultural director, Vida Stabler. I will also be using the book, *The Omaha Tribe: Volumes Land ii* for further information on the Omaha people and traditions.

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