As a sequel to the Robotics lesson, we have students design a group name (patch) much like space or military organizations do to commemorate events or activities. As students have completed their project, it is time to create the patch so showcase their robots and the obstacle course activity.

I. Title of Lesson: Mission Patch

II. Grade Level and Subject Area: 4th grade, various subject areas (modifiable to 3rd/5th)

III. Standards

A. California State Standards

Visual Arts 2.0 Creative Expression Students apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art.
3.0 Historical and Cultural Context Role and Development of the Visual Arts 3.1 Describe how art plays a role in reflecting life.
4.0 Aesthetic valuing Responding to, Analyzing, and Making Judgments About Works in the Visual Arts 4.2 Identify and describe how a person's own cultural context influences individual responses to works of art. 4.3 Discuss how the subject and selection of media relate to the meaning or purpose of a work of art. Students analyze, assess, and derive meaning from works of art, including their own, according to the elements of art, the principles of design, and aesthetic qualities.

5.0 Connections, Relationships, Applications

Students apply what they learn in the visual arts across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.

Visual Literacy

5.3 Construct diagrams, maps, graphs, timelines, and illustrations to communicate ideas or tell a story about a historical event.

B. NGSS: Engineering

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

C. CCSS Mathematics

G.4.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. (Two dimensional shapes should include special triangles, e.g., equilateral, isosceles, scalene, and special quadrilaterals, e.g., rhombus, square, rectangle, parallelogram, trapezoid.)

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

D. Writing

W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. W.4.6 With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.

E. Speaking and Listening

SP. 4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

F. Literacy

RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

Engaging Context:

Measurable Objectives: Students will create a visual presentation to showcase their robots, patch, and team effort. Using document reader, keynote, powerpoint, or other visual aids.

Total Time: Get it done in one 90 minute day with a recess/lunch break in between. Otherwise, it took two days. This will depend on the level of detail and color desired for final project. I have done it on a Friday, students complete parts on the weekend, and complete Monday.

Materials List:

White art paper

Colored pencils, markers, crayons

Compass and ruler

Example Mission Patches

Computer with internet access

Device with presentation applications

Web Resources:

- Present PowerPoint on NASA's Mission Patches

Download by typing on Google:

mccullochscience.wikispaces.com/file/view/NASA+Mission+Patches.ppt

- Website on some Chinese mission patches

http://www.spacepatches.nl/china/shenzhou5.html

- Misc. space mission patches website

http://www.seasky.org/space-exploration/mission-patches-menu.html

- Coins minted by the People's Bank of China on Jade Rabbit Mission

http://agaunews.com/new-release-peoples-bank-of-china-celebrates-moon-landing/

Procedure:

Each mission into space involves a new crew of astronauts. The astronaut crew works with a graphic designer to create a patch that represents the crew and their mission. The mission patch includes all of the crew names and the graphic design depicts aspects of the mission and of the crew's lives that are most important. For example: patriotic symbols, the Space Shuttle, the Orbiter, the International Space Station, and even symbols that represent fallen colleagues. Each mission patch comes with a detailed description to explain the choice of the design.

1. Discuss what a mission patch is and how astronauts work together to design a patch.

2. Discuss the significance of American symbols (Read aloud: *America Is* by Louise Borden). Refer to the research and discussions on China's Jade rabbit and the reasoning for calling their lunar rover Yutu.

Draw patch using a polygon solid figure (example: triangle, pentagon, hexagon, etc.) or a circle with a 4-inch diameter

Divide patch into four quadrants

The following information should be included on robotics patch:

Quadrant I • Mission Number • Mission Date	Quadrant II • Detailed drawing representing destination and task
Quadrant III • Mission Name • Names of each team member	Quadrant IV • Mission motto

Continue working on assignment. Students will also present their patch using Google Slides. Teamwork, art, and presentation (listening/speaking) grades will be gathered. Students interest in space and patches in general are always high. Patches are seen on every day clothing, race car jackets, and tv/movies (refer to this website for awe! http://www.scifigeeks.com/index.php/cPath/4324?osCsid=76d4a6a5d6a6d78ffe168a72dbe2c251 this website has patches from everything from the Umbrella Corporation, to LOST, to Star Trek/Star Wars military units). Students know patches, and here they will see real life application of patch design. Why choose a particular symbol, color, or numbers.