“Every manner of scientific inquiry begins as a nonverbal spark in the mind, and more often than not that first burst of perception is visualized more fully on a sheet of paper.”

~Nick Basbane, On Paper
Dear educators,

As schools adapt to new technologies and embrace the inclusion of 21st-century skills, many recognize that learning experiences must still exist in the physical and concrete world.

The American Forest & Paper Association shares this perspective, and, in particular, sees a special relationship between creativity and paper. From visual arts to literature, engineering to music to advertising, creative processes often rely on paper products to bring ideas to life. And, since paper products are renewable, versatile, sustainable, recoverable, and durable, they’re also sensible and inspiring canvases for creative works.

To that end, we are pleased to provide you with the “Creativity in the Classroom” program to help you integrate proven creative approaches into your repertoire by encouraging paper-based creativity in all content areas.

This program includes five separate activities to foster creativity in language arts, science, math, social studies, and fine arts.

All of the activities are designed with sustainability in mind. AF&PA members produce recyclable products made from a renewable resource, and believe that sustainable practices today will yield positive results for a better tomorrow.

We invite you and your students to join us in reaching this very important goal as you explore creativity in the classroom.

Best,
Your friends at the American Forest & Paper Association

See pages 14 – 16 of this guide for additional resources for educators and a guide to the standards addressed by these lessons.

Better Practices, Better Planet 2020 – AF&PA’s sustainability initiative - is a proactive commitment to the long-term success of our industry, our communities, and our environment, which includes a paper recovery and recycling goal of 70% by the year 2020.
Overview of Creativity in the Classroom

With an ever-increasing focus on standards-based education, teachers are often left with little time to incorporate creative approaches to instruction. The good news is that with the right strategies, methods, and materials on hand, you can foster and develop creativity in every student. As you’ll see, paper products, such as writing paper, sketch paper, poster board, photographic paper, and cardboard, are the perfect fit for supporting the creative process!

Creativity instruction is not a “free-for-all.”

Students need scaffolding and structure in order to most effectively develop creative skills. Within this lesson guide, you will find activities that include these approaches to integrating creative processes in the classroom:

- **Creative activities should result in a tangible “artifact.”**
  An idea alone is not creative. The creation of an “artifact” is a necessary part of the creative process. Encourage students to see their ideas through to the end in a responsible way by using paper-based products.

- **Provide students with open-ended problems to both define and solve.**
  Allowing students both to define the problem and to solve it will enhance creative thinking.

- **Provide opportunities for both individual and collaborative activities.**
  A balance of individual and collaborative work increases creativity and teamwork.

- **Allow for unscheduled periods of “incubation.”**
  Allowing students “down time” to process ideas can encourage higher levels of creativity.

- **Allow students to engage in cross-curricular work.**
  Creativity is enhanced when individuals examine more than one domain, each with its own set of established practices and procedures. Encourage students to find connections between the different subject areas.

- **Allow (and encourage!) “productive failure.”**
  Creativity occurs in a series of “trial and error” cycles. So, lower the stakes for your students by encouraging students to explore creative approaches to problem-solving without fear of failure (e.g., do not assign a letter grade to a particular assignment).
Activity 1
Write Here; Write Now

Objective: Using a photograph as a cue, write a creative narrative with descriptive details, dialogue, and sequenced events.

Standards: Common Core ELA—Literacy: Writing (see page 15)

Time: Several class periods over the course of two weeks

Materials:
- Writing paper
- Pencils
- Photographs

Activity Preparation:
1. Gather materials
2. Select and print photographs, one for every three students. Be sure to select a variety of photographs over time (both historical and contemporary), but each photograph should include several people and a variety of other objects. Ideally, they would also represent a variety of content areas (science, social studies, arts, etc.). Some suggested sites to find images include:
   - Google Images (http://www.google.com/imghp)
   - Library of Congress (http://www.loc.gov/pictures/)
   - Getty Images (http://www.gettyimages.com/)
   - USA.gov (http://www.usa.gov/Topics/Graphics.shtml)

Procedure:
1. Have students bring a picture in from home, or show students a photograph, such as:

   Choose one of the pictures the students brought in or using the image above, have students write down what they think an appropriate title for the photograph would be.

2. Have students share their titles. List several on chart paper. Then, have students compare and contrast their titles. Ask: Are any titles similar? Are any unique? Do you all agree on what’s shown in the picture? Could it be anything else? Provide students with an alternate creative title. Have students generate additional title ideas, and list them on the chart paper.

3. Hang up the selected photographs. Have students each select a photograph that’s not their own (three students per photograph). Then, have them independently create several possible titles for the photograph.
4. In groups of three, have students share titles and select one. However, allow student groups to create an entirely new title during this time if they are not satisfied with the individual ones.

5. Explain to students that they will be working in groups of three to draft a story about the photograph. Explain that they will be drafting a narrative—or a story with a series of events—that is related to the picture. Explain that the students must include the following elements in their stories:
   a. At least three characters,
   b. Dialogue between characters,
   c. Temporal words to show order of events (first, next, finally, etc.)
   d. Closure to the story

   Explain to students that they do not need to describe what is happening in the picture. Rather, the picture should represent a “slice in time” in the narrative of the story. The picture can be the result of the events, a single event in the narrative, or what leads to the events in the narrative.

6. Have students work first in their groups to develop a storyboard for the story, and then decide how to collaborate effectively. For example, one group may choose to have different students write different parts of the narrative, while others may choose to have one write, one edit, and one illustrate different parts.

7. Allow several class periods over a period of one to two weeks for students to work on the assignment to allow for reflection and “incubation.”

8. After students have completed their narratives, have them “publish” them by creating a cover and drawing additional illustrations for other events in the narrative.

Closure (low-stakes evaluation):

1. Provide students with a checklist of necessary elements (characters, dialogue, temporal words, closure) in the narrative. Then, have them select another groups’ narrative to read. While reading, the group should identify each of the elements. Then, each student should write a brief review of the work detailing what they believe to be creative integration of the elements.

Extensions:

- Visit ReadWriteThink (www.readwritethink.org) for a wealth of resources related to the skills addressed in this lesson. The site provides activities, full lesson plans, and a variety of interactives to hone skills and foster creativity.

- Have students trade stories and write sequels or prequels to the narratives.
Activity 2
Houston, We Have a Solution.

**Objective:** Students will design a solution to an existing problem and use common materials to create a model or prototype.

**Standards:** Next Generation Science Standards (see page 15)

**Time:** Several class periods over the course of two weeks

**Materials:** Teachers can select whatever paper products and supplemental materials they have on hand (or that students bring from home). However, it is recommended that each group has a cardboard box filled with the following:

- Shoebox
- Writing paper
- Large construction paper
- Newspaper
- Masking tape
- Crepe paper streamers
- Stapler and staples
- Glue
- Scissors
- Magazines
- Cereal boxes
- Sticky notes

**Preparation:**
1. Preview the Apollo 13 Video
2. Gather all materials
3. Identify a local problem in need of a solution, if opting not to use the problem provided in Step 5. Add problem-specific materials to the box.

**Procedure:**
1. Ask students if they’ve ever had a problem because they didn’t have the best materials (e.g., wrapping a present with no wrapping paper). Have students share their experiences and how they solved the problem. Explain that good problem solvers figure out ways to solve the problem with whatever materials they have.

2. Provide students with a brief, age-appropriate overview of the Apollo 13 mission (e.g., “Astronauts were heading to the moon, and their spacecraft had a problem. They decided to return to Earth without going to the moon, but they were running out of breathable air because they didn’t have the right part to clean the air. The part they had was square, but it needed to fit into a round hole. Engineers on the ground were trying to help them, so they gathered up all of the materials that the astronauts had on the spacecraft. This included cardboard, paper, duct tape, and plastic. Using those materials, they had to explain to the astronauts over the radio how to build the part.”) It is not important that they understand the filter problem, rather that there was a problem the engineers needed to solve using limited materials.
3. Show students a clip from a Dateline episode about the incident (http://www.nbcnews.com/id/36471007/ --select Part 5, and show the clip from 4:43 to 6:15 timestamps).

4. Remind students that the flight manual—a book—was reused for the filter. Have students share why they think that using paper is helpful for solving engineering problems (e.g., durable, sustainable, flexible, versatile, etc.).

5. Ask students to list problems that they encounter in their own lives (e.g., how to make a box that will encourage family members to sort recyclables). After 3 to 5 problems have been identified, have students select a problem to solve.

6. Explain to students that they will work in groups to solve the problem using only the items found in the box. Encourage them to do the following:
   a. Independently create a design that will solve the problem.
   b. Share designs within the group, and select one design to build (or create a new one based on multiple designs).
   c. Build and test the design; repeat as necessary.

Closure (low-stakes evaluation):

1. After the designs are built, host an “innovation fair” where students display and demonstrate their prototypes. Invite other classes or parents to attend the fair, and provide feedback on what they like about the design and ways in which it could be improved. Allow students in your class to provide feedback to each other, as well.

Extensions:

- Select additional standards from other subject areas to include in the development of the solution. For example, you can include a ruler, compass, and protractor in the materials box and require students to make use of them in their designs.
- Have students challenge each other by working in teams to identify a problem and providing their own collections of materials for other student teams (or individuals) to use in solving it.
Activity 3
Original Origami

Objective: Use mathematical process skills in creating original origami

Standards: Common Core Standards for Mathematical Practice (see page 15)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Use appropriate tools strategically.
4. Attend to precision.
5. Look for and make use of structure.

Time: Several class periods over the course of two weeks

Materials:

• Paper
• Ruler
• Scissors

Preparation:

1. Gather materials.
2. Preview websites.

Procedure:

1. Tell students that mathematics is not simply about numbers and operations. Rather, math is also about logic, reasoning, and finding solutions. Explain that the study of shapes in mathematics is called geometry, and one way of learning a lot about shapes, logic, reasoning, and finding solutions is through origami. Since origami allows students to experience mathematical concepts in a concrete form, and paper is very easy for the students to manipulate, it is the perfect medium for upper elementary students to solve geometric problems.

2. Explain that origami is the traditional Japanese art of paper folding that uses mathematical concepts using one sheet of paper to make different three-dimensional objects (animals, boxes, etc.).

3. Have students practice creating origami using instructions found on www.origami-instructions.com/origami-for-kids.html. This website shows a variety of simple and appropriate animals and objects that your students can make. When they are done, have them unfold the creations and identify shapes, angles, lines, vertices, etc., made by the creases in the paper.
4. Provide them with several new paper squares to experiment with making their own creations. Explain that a lot of tries may be necessary to create the animal, object, or effect that they want.

5. Then, show the trailer for the film “Between the Folds” (www.greenfusefilms.com) to inspire students. Have them work in groups, and name an animal or object they would like to make. Have students collaborate over several class periods to create an origami design to make that object. Remind them that the designs can be simple and do not need to be overly complicated.

Closure (low-stakes evaluation):

1. After the groups have created a design they are pleased with, have them create a video or write out instructions so that others can create the same design. Encourage them to use mathematical terms that are age appropriate, such as shape names, symmetry, equal, half, measurements, etc., depending upon the topics you are currently covering in your math curriculum.

2. Have students follow their peers’ instructions to create origami objects, and provide feedback on what was helpful or lacking in the instructions.

Extensions:

- Ask students to share ways in which origami might be useful other than as art. Show them http://www.youtube.com/watch?v=kziAhMEiLXk to give them an idea of how origami is important to health, science, and other fields.


- If your students are advanced and interested in a challenge, have them watch the TEDTalks video related to math and origami http://www.ted.com/talks/robert_lang_folds_way_new_origami.html.
Objective: Students will learn about local approaches and policies related to recycling, and then create their own solutions to a recycling problem.

Time: Several class periods over the course of two weeks

Materials:
- Paper
- Pencils
- Markers
- Envelopes
- Postage stamps
- Basic classroom materials

Activity 4
Paper Policies

Preparation:
1. Review paperrecycles.org/ to find materials relevant to your students’ proposed solutions.

Procedure:
1. In a large group, ask students to describe some school and class rules or routines. Ask them to explain why those rules and routines exist. Then, explain that rules and routines used by the government are called policies.

2. Tell students that for this activity, they will be focusing on policies related to recycling, particularly with paper. Explain that since paper is used for many purposes throughout the day, it’s important that we are responsible with its use. Some ways that people can be responsible when using paper is to make sure that paper products are repurposed, recovered, and recycled. Explain that there are often local rules or policies to encourage responsible paper use.

3. Ask students to identify some class, school, or family rules related to recycling, or, for older students, ask them to identify local policies related to recycling. One example is that a local community’s policy might be to collect recyclables from the curbside, while another community’s policy might be that community members drop off recyclables at a certain location. Students can ask at home about their parents’ workplace recycling program or the school policy of an older sibling at a different school.

4. Have older students independently research relevant statistics from paperrecycles.org/ to encourage idea generation.

5. Explain to students that they will use creativity to find ways to increase “paper recovery” or the amount of paper collected for recycling. They will then turn that idea into a written recovery program. Have students individually sketch out (in writing or images) what their new program or approach would be. Explain that the program or approach should be clearly written, possible, and fair. Then, have them share their ideas with the rest of the class.
6. Finally, have students organize themselves into groups (with your assistance) based on similarities between the ideas. Once students are grouped by idea, have them refine their programs or approaches into a final comprehensive draft.

Closure (low-stakes evaluation):

1. Have students publish their approaches in a medium of their choice (letter to a government official, poster for the school hallway, newspaper article, etc.).

**Extensions:**

- Have students follow business letter format for letters, include persuasive argument elements in an op-ed letter, or utilize research skills when identifying local recycling laws.

- If students do not receive a positive response from a recipient of a letter, have them revise the letter and send to a different local official.

- Have students evaluate a current rule or law related to recycling. Have them determine if the law is clearly written, possible, and fair.

- Have students consider how the process they followed in class somewhat mimics the process outlined in the “I’m Just a Bill” video. Have them identify at which points in their process they were doing something that legislators do.

Interested in showing off your school’s recycling practices?
Check out the AF&PA Recycling Awards at paperrecycles.org/recycling-awards, and submit your school for next year’s annual recycling awards program or for tips to improve your existing program.
Activity 5
Personal Paper Project

Objective: Use a variety of techniques and processes to create an autobiographic paper-based piece of artwork.

Time: Several class periods over the course of two months

Materials:
- Shoebox
- Writing paper
- Large construction paper
- Newspaper
- Masking tape
- Crepe paper streamers
- Stapler and staples
- Glue
- Scissors
- Magazines
- Cereal boxes
- Magazines
- Markers
- Paint

Preparation:
1. Prepare all materials.
2. Preview the galleries in Step 6.
3. Develop a list of words, ideas, or concepts that are relevant to the students (suggestions are provided in Step 4).

Procedure:
1. Have students make paper to use as the medium for their personal paper projects. Begin by having them watch a video on how to make paper (www.paperrecycles.org/recycling-resources/school-recycling), and then replicate the steps in the classroom.

2. As a warm-up exercise, explain to students that they will be given a word and will have to use art to convey what the word means to them in a visual form. For example, you will show them the word “love” and give them three minutes to use whatever materials they have on hand to visually represent what love means to them. Repeat several times with these suggested words or other words: love, rest, flight, sorry, change, fear, want, etc.

3. Share several examples of the students’ work with the class without identifying the inspirational word. Have students guess which words were inspiration for the pieces and explain why they think so. Invite the students whose art is displayed to volunteer, if they wish, to explain their work. Then, explain that different artists use different techniques, materials, and processes to express their ideas. Two different artists inspired by the same thing can have two totally different results.

4. Explain to students that paper is a common material used by artists, but there are many creative ways to use paper. Show them the following galleries for inspiration:
5. 🌟 Explain to students that they will be using themselves as inspiration for pieces of art. Explain that just like the previous exercise, no two pieces will be the same. However, they are going to have a few restrictions when making their creations. The students’ visual “autobiography”:
   a. must be made primarily from paper;
   b. cannot use any words or text; and
   c. must show something about the artist.

6. 🌟 Then, have students work over the course of several class periods to create their pieces. If students are experiencing a creative block, encourage them to think about experiences from their lives or their unique personality traits. Also, have them consider making symbolic, not literal, representations of their lives. Lastly, remind them that the pieces of artwork do not need to be two-dimensional. Paper-based artwork can be three-dimensional and sculptural or architectural, too.

Closure (low-stakes evaluation):

1. Create a gallery of the students’ work, and invite students and families to view the gallery. Then, have other students’ families try to match the students with the artwork.

Extensions:

- 🎨 Have students create paper-based artistic biographies for people studied in other classes (historical figures, literary characters, scientists, etc.).
- 🎨 At the end of the school year, have students create another artistic autobiography and have them compare them to see if they perceive themselves differently over time. They can choose to expand upon or change their previous piece or begin a new one entirely.
Educator Resources

American Forest & Paper Association: Paper Recycles
www.paperrecycles.org

Creativity and the Classroom

Creativity and the Common Core
http://edu.moca.org/education/teachers/commoncore

21st Century Skills and the Common Core

30 Ways to Promote Creativity in Your Classroom
http://www.innovationexcellence.com/blog/2013/01/10/30-ways-to-promote-creativity-in-your-classroom/

Odyssey of the Mind
http://www.odysseyofthemind.com/

TED: The Creative Spark
http://www.ted.com/playlists/11/the_creative_spark.html

Creative Educator
http://creativeeducator.tech4learning.com/

Creativiteach: Creativity for 21st Century Classrooms
http://creativiteach.me/

Writing and Creativity: Creative Writer Resources
http://takemywordforit.net/writer-resources

Science and Creativity: Teaching Creativity and Inventive Problem Solving in Science
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2736021/

Math and Creativity: Fostering Creativity through Instruction Rich in Mathematical Problem Solving and Problem Posing
http://www.emis.de/journals/ZDM/zdm973a3.pdf

Arts and Creativity: Educators combat “creativity crisis” in art instruction
http://www.districtadministration.com/article/educators-combat-%E2%80%9Ccreativity-crisis%E2%80%9D-art-instruction
Write Here; Write Now

Common Core ELA—Literacy: Writing (grade 3)

• 3.3 Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
  • 3.3a Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally.
  • 3.3b Use dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or to show the response of characters to situations.
  • 3.3c Use temporal words and phrases to signal event order.
  • 3.3d Provide a sense of closure.

Houston, We Have a Solution.

Next Generation Science Standards (grade 3)

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.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

• 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

ETS1.A: Defining and Delimiting Engineering Problems

• Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)

Original Origami

Common Core Standards for Mathematical Practice (grade 3)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Use appropriate tools strategically.
4. Attend to precision.
5. Look for and make use of structure.

Paper Policies

National Standards for Civics and Government (grade 4)

F. How can you evaluate rules and laws?

Content summary and rationale

Not every rule or law is a good one. It is important, therefore, that young children become familiar with criteria that can be used to identify the strengths and weaknesses of rules or laws. It also is important that they learn to draft rules or laws that meet the criteria. An understanding of criteria useful in evaluating rules and laws also is important for adult Americans. It provides citizens with a basis for participating intelligently in the evaluation of existing and proposed laws.

Content standards

1. Evaluate rules and laws.
2. Students should be able to explain and apply criteria useful in evaluating rules and laws.

To achieve this standard, students should be able to:

• identify the strengths and weaknesses of a school rule or a state law by determining if it is:
  • well designed to achieve its purposes;
  • understandable, i.e., clearly written; purposes are explicit;
  • possible to follow, i.e., does not demand the impossible;
  • fair, i.e., not biased against or for any individual or group;
  • designed to protect individual rights and promote the common good;

• draft a school rule that meets these criteria.

Personal Paper Project

National Art Education Association: National Visual Arts Standards (grade 4)

1. Content Standard: understanding and applying media, techniques, and processes

Students:

a. know the differences between materials, techniques, and processes;

b. describe how different materials, techniques, and processes cause different responses;

c. use different media, techniques, and processes to communicate ideas, experiences, and stories.

2. Content Standard: Using knowledge of *structures and functions. Use visual structures and functions of art to communicate ideas.

3. Content Standard: Reflecting upon and *assessing the characteristics and merits of their work and the work of others.

a. Understand there are various purposes for creating works of visual art.

b. Describe how people's experiences influence the development of specific artworks.

4. Content Standard: Making connections between visual arts and other disciplines.

• Identify connections between the visual arts and other disciplines in the curriculum.