

## Exploring Pearls

### Elementary: Ages 14-16

**Rationale:** Students will explore pearls, including, how mollusks make pearls, the history and importance of the different uses of pearls, different types of pearls and the difference between natural and cultured pearls, and eco-friendly pearl farming

### Learning Outcome/Goal:

- The students will develop a working knowledge of how mollusks make pearls
- The students will develop and understanding of the history and importance of the different uses of pearls
- The students will develop an understanding of and be able to identify the different characteristics of pearls as well as the difference between natural and cultured pearls, including why pearls are different colors
- The students will develop an understanding what eco-friendly pearl farming consists of

### Key Stage 4:

#### *Development of Scientific Thinking*

- explaining everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments

#### *Biology*

- living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways

#### *Ecosystems*

- positive and negative human interactions with ecosystems

### Materials/Resources:

- Classroom set of pearls
- Eco-friendly Pearl Farming articles
  - <http://news.nationalgeographic.com/news/2013/08/130811-eco-friendly-pearl-farming-kamoka-polynesia-oysters-environment/>
  - <http://oceanbites.org/the-grit-in-the-oyster-pearl-farming-in-french-polynesia/>
  - <http://www.seacology.org/about/>
- What Makes a Black Pearl Black article (<http://www.livescience.com/32856-what-makes-a-black-pearl.html>)
- How a pearl is formed video (<https://www.youtube.com/watch?v=T18E58vOTus>)
- Websites about pearls
  - <http://www.amnh.org/exhibitions/past-exhibitions/pearls>
  - <http://www.gia.edu/pearl>
- How a Pearl is Formed article ([http://www.allaboutgemstones.com/pearl\\_composition.html](http://www.allaboutgemstones.com/pearl_composition.html))
- Guiding Pearl Research (see attached)
- Pearl Grading System (see attached)

**NOTE: This lesson can be completed as a whole lesson, or can be broken up and completed over the course of several days**

**Procedure:**

**Introduction**

1. Hold up a few of the pearl samples. Ask the students to tell you what you are holding. Have the students list as many facts as they can regarding what they know about pearls. Record their responses on chart paper or a white/black board. Tell the students that they are going to be exploring pearls in depth.

**Development**

2. Tell the students that they are going to be learning about how mollusks make pearls. Students should read the How Pearls are Formed article and watch the How Pearls are Formed video. Then, have a discussion that compares and contrasts the information they learned in the article and the video.
3. Explain to the students that pearls, throughout history, have been highly treasured and sought after. Tell the students that they are going to be researching the history and importance of pearls. The information that they find is then going to be used to create a class timeline. Split the students in to small groups. Assign each group a region to research (see Guiding Pearl Research Form attached).
4. The students will now have a chance to explore the pearl samples. Each student should get a Pearl Grading System sheet. Go through the sheet with them to ensure that they understand each attribute. Split the students into small groups of 2-3 students so that each group of students has a bag of pearls (there are 10 sample bags). The students should explore each pearl and determine the grading of each pearl.
5. After the students have had the opportunity to grade each sample pearl, bring the students back together and have them share what they learned about grading pearls. Explain to the students that someone called a gemologist does what they just did. A gemologist is someone who is trained and qualified to identify and evaluate all different types of gems and gemstones.
6. Tell the students that most pearls that are in the market currently are cultured pearls. Remind them that cultured pearls are those that are “farmed.” Tell the students that they will be learning about eco-friendly pearl farming. The students should read the articles about eco-friendly pearl farming and take notes on what that means. The students should write a brief paragraph or two about what eco-friendly pearl farming is and why it is important.

**Wrap-Up**

7. Have a discussion with the students about what eco-friendly pearl farming is and why it is important. Ask the students how what they have learned might affect the way they purchase pearls in the future.

## Guiding Pearl Research

Use the regions listed below to assign research to small groups of students.

### Regions:

- Roman and Byzantine Empires
- Renaissance
- India and the Middle East
- Russia
- Imperial China
- 20<sup>th</sup> and 21<sup>st</sup> Centuries

## Pearl Grading System





































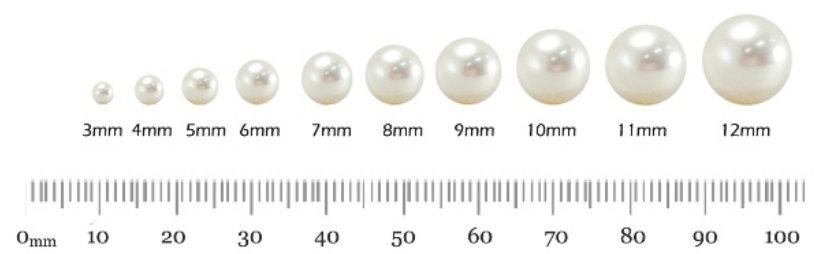
There is no single grading system for pearls. However, many retailers utilize the AAA or AAAA pearl grading system. When using this system, a pearl is graded based on the lowest value factor. For example, a pearl might get an AA in luster, AAA in shape and AAA in surface. Therefore, the pearl is graded as an AA because of its lowest value (luster).

**AAA** grade pearls are the ones with the highest luster, least blemishes on the surface and have a rounder shape (although perfect spheres are unusual in Freshwater pearls). These pearls have a thick nacre coating and are normally white with Pink or Gray overtones. Necklaces are also rare in this grade and most pearls are sold as strands or as individual pieces or as rings and pendants. These grades of pearls are the largest in size exceeding 8mm (sizes of 10mm or more amongst freshwater pearls are very rare)

**AA** pearls have a good luster and their surface is slightly flawed but hidden by mounting or drilling the flawed area, whereby only the flawless surface is visible. Their shape may be less round than the "AAA" grade pearls, but not of a semi-round shape or a baroque shape. Rolling a pearl along a straight surface determines its shape (a straight line signifies a round shape, a zig-zag line signifies the shape is semi-round and a semi-baroque shape will rotate on one side only). The semi-baroque shape is further divided into drop, button, pear and oval - all four shapes are nearly similar with small differences. "AA" grade pearls are found in shades of white, off-white or cream with pink, silver and green overtones. They are available in sizes of 5mm to 8mm and have medium nacre thickness.

**A** grade pearls are available in many shapes and their natural shapes gives them a look that is unique yet elegant. These pearls have a flawed surface of more than 25%, but it is not visible from a distance. These pearls make an economical buy and are available in a variety of designs, a spectrum of colors and shapes like rice or seed pearls, oval or pear shaped, button and baroque shapes. These are normally smaller size pearls between 1mm to 4mm in size. The nacre coating in these pearls is not as thick as pearls of "AA" and "AAA" grade pearls. But in no way does the lack of luster or size or shape reduce the beauty of these pearls.



<p><b>Luster Grade</b></p>	<p>Luster or shine is the indication of how well the pearl reflects the light. A good way to think of luster is like a mirror. It is a very important value factor for the overall grade of the pearls.</p>	<table border="1"> <thead> <tr> <th data-bbox="625 199 820 262">A</th> <th data-bbox="820 199 1031 262">AA</th> <th data-bbox="1031 199 1250 262">AAA</th> <th data-bbox="1250 199 1453 262">AAAA</th> </tr> </thead> <tbody> <tr> <td data-bbox="625 262 820 514">             Nice light reflection, reflected image slightly fuzzy         </td> <td data-bbox="820 262 1031 514">             Very nice reflection, with good reflection         </td> <td data-bbox="1031 262 1250 514">             Nice, sharp and very clear reflection         </td> <td data-bbox="1250 262 1453 514">             Outstanding luster, amazing reflection and clarity         </td> </tr> </tbody> </table>	A	AA	AAA	AAAA	 Nice light reflection, reflected image slightly fuzzy	 Very nice reflection, with good reflection	 Nice, sharp and very clear reflection	 Outstanding luster, amazing reflection and clarity
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<p><b>Surface Grade</b></p>	<p>Surface describes any divots, small natural scratches and other pearl imperfections on the body of the pearl</p>	<table border="1"> <thead> <tr> <th data-bbox="625 529 820 592">A</th> <th data-bbox="820 529 1031 592">AA</th> <th data-bbox="1031 529 1250 592">AAA</th> <th data-bbox="1250 529 1453 592">AAAA</th> </tr> </thead> <tbody> <tr> <td data-bbox="625 592 820 970">             81% of the pearl surface is clean however imperfections are visible on the surface.         </td> <td data-bbox="820 592 1031 970">             86% of the pearl surface is clean. When looking at the pearl closely it is possible to see small and occasional imperfections.         </td> <td data-bbox="1031 592 1250 970">             95% of the pearl surface is clean. Imperfections that are present are not easy to find - pearl must be carefully studied to see imperfections.         </td> <td data-bbox="1250 592 1453 970">             99% of the pearl surface is clean. Extremely detailed and up-close study of the pearl is needed to find imperfections.         </td> </tr> </tbody> </table>	A	AA	AAA	AAAA	 81% of the pearl surface is clean however imperfections are visible on the surface.	 86% of the pearl surface is clean. When looking at the pearl closely it is possible to see small and occasional imperfections.	 95% of the pearl surface is clean. Imperfections that are present are not easy to find - pearl must be carefully studied to see imperfections.	 99% of the pearl surface is clean. Extremely detailed and up-close study of the pearl is needed to find imperfections.
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<p><b>Shape Grade</b></p>	<p>Pearls grow in various shapes, from baroque to perfectly round, and anywhere in between. The roundness of the pearl can be very small, however those pearls reaching the perfect roundness, also command the most expensive price.</p>	<table border="1"> <thead> <tr> <th data-bbox="625 984 820 1047">A</th> <th data-bbox="820 984 1031 1047">AA</th> <th data-bbox="1031 984 1250 1047">AAA</th> <th data-bbox="1250 984 1453 1047">AAAA</th> </tr> </thead> <tbody> <tr> <td data-bbox="625 1047 820 1281">             Non-symetrical, off-round - slightly irregular         </td> <td data-bbox="820 1047 1031 1281">             Round to casual observer; slight off-round symmetry         </td> <td data-bbox="1031 1047 1250 1281">             The pearls are of spherical shape.         </td> <td data-bbox="1250 1047 1453 1281">             The pearls are of a near perfect spherical shape         </td> </tr> </tbody> </table>	A	AA	AAA	AAAA	 Non-symetrical, off-round - slightly irregular	 Round to casual observer; slight off-round symmetry	 The pearls are of spherical shape.	 The pearls are of a near perfect spherical shape
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<p><b>Size (in mm)</b></p>	<p>Pearls range from 2-16 millimeter in diameter, depending on the mollusk used.</p>	 <p>3mm 4mm 5mm 6mm 7mm 8mm 9mm 10mm 11mm 12mm</p> <p>0mm 10 20 30 40 50 60 70 80 90 100</p>								

