# Schools to Playhouse Curriculum Guide

#### Dear Educators,

Welcome to the Arcata Playhouse Schools to Playhouse Show series. We sincerely hope that you and your students enjoy the opportunity to see and listen to great live theatrical performances. This year's series is also sponsored by HCOE Rising Stars Foundation, Wildberries Marketplace, Kokotat Water Sports Wear, Holly Yashi Jewelers, and Western States Arts Federation.

The guide includes an introduction to the shows and activities to introduce the students to the world of live theater. These activities are cross-curricular and address many California State and Common Core standards.

In order to continue this program in the future, it is imperative that we receive both the Pre-Show and Post-Show survey as well as any supplemental activities that you have incorporated into the lessons below.

Appreciation/Thank you letters may be mailed to HCOE: C/o Stacy Young, 901 Myrtle Ave., Eureka, CA 95501 Thank you for your participation!
The Arcata Playhouse

#### Goals:

- \*To familiarize students with the world of live theatrical performance
- \*To foster interest in live theater and performance attendance

#### **Teaching Procedures:**

The following lessons can be presented in a number of ways. The lessons will range from about 20 - 45 minutes each or approximately two hours in total. It is recommended that you break up the two sections:

<u>Pre Show Activities:</u> Audience Etiquette, performer bio, shadows and science, and spinning globe activity.

Before beginning the lesson, please handout the Pre-Show Survey to all of your students.

Post Show Activities: Investigating shadows, and paper/origami.

After attending the performance please choose a follow up activity and complete the post —show survey.

#### World of Wonder

#### Pre-Show Activities

Objectives: Students will learn about history related to the *World of Wonder* storyline. Students will identify how artists use storytelling, voice, singing, acting, sound, and music to bring a show to life.

#### 1. Engaging Storytelling (whole class discussion)

Discuss with the students the skills involved in telling of a story.

What qualities maintain or heighten a listener's interest? List these, e.g. eye-contact, facial expression, gesture, pause, variation in rhythm, stress, pitch, pace volume, etc.

What qualities might lose a listener's interest? E.g. shuffling around, mumbling, fidgeting, speaking in a monotone, speaking too slowly/quickly, etc.

Have students identify ways in which the narrator held their attention.

## California Content Standards addressed in these lessons:

#### **English and Languages Arts Standards:**

**Grade 3:** Narrative Analysis of Grade-Level-Appropriate Text 3.2 Comprehend basic plots of classic fairy tales, myths, folktales, legends, and fables from around the world.

**Grade 4**: 2.1 Make narrative presentations:

- a. Relate ideas, observations, or recollections about an event or experience.
- b. Provide a context that enables the listener to imagine the circumstances of the event or experience.
- c. Provide insight into why the selected event or experience is memorable

**Grade 5:** 2.2 Write responses to literature:

- a. Demonstrate an understanding of a literary work.
- b. Support judgments through references to the text and to prior knowledge.
- c. Develop interpretations that exhibit careful reading and understanding.

#### Visual and Performing Arts Standards:

**Grade 5:** Artistic Perception: 1.0 Comprehension and Analysis of the Elements of Theatre, 1.2 Identify the structural elements of plot (exposition, complication, crisis, climax and resolution) in a script or theatrical experience. Creative Expression: Collaborate as an actor, director, scriptwriter or technical artist in creating formal or informal theatrical performances.

**Grade 4:** Creative Expression: Development of Theatrical Skills, 2.1 Demonstrate the emotional traits of a character through gesture and action **Grade 3:** Careers and Career-Related Skills 5.2 Develop problem-solving and communication skills by participating collaboratively in theatrical experiences

## Pre Show Survey

Have you ever performed in a show?	live play or
YesN	No
If yes, when and where did you	ı perform?
If no, are you interested in per show someday? Have you ever attended a show Arcata Playhouse?	J
YesNo	)
Write one work that best desc you feel about theater and play	

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Have you eve show?	r perform	ned in a live play or		
	Yes	No		
If yes, when and where did you perform?				
If no, are you interested in performing in a show someday?				
Have you ever attended a show at the Arcata Playhouse?				
	Yes	No		
Write one work that best describes how you feel about theater and plays:				

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show?				
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Arcata Playhou	ise?			
	Yes	No		
Write one worl you feel about		pest describes how r and plays:		

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Have you ever show?	performo	ed in a live pla	y or		
	_Yes	No			
If yes, when and where did you perform?					
If no, are you interested in performing in a show someday?					
Have you ever attended a show at the					
Arcata Playho	use?				
	_Yes	No			
Write one work that best describes how you feel about theater and plays:					

## Leland Faulkner Biography

Leland Faulkner's performances are a feast for the heart and mind. He is a magician, a character actor, and a mime artist. His performances stir the imagination and bridge our differences by bonding us with creative spirit, humor, and mystery. He is famed for his Shadowgraphs and Chapeaugraphy, two lost arts that have been given a fresh breath of life under his care, yet he is more than that.

Leland Faulkner has been an actor, mime, and magician for over thirty years. Early in his career he worked with Affiliate Artists as a corporate arts liaison in communities throughout the United States. For many years he partnered, toured, and taught with master mime Tony Montanaro, and was the artistic director of Celebration Barn in South Paris, Maine. In the years following he has taught and performed at major venues, schools, colleges, theatre festivals, cultural exchange programs, international circuses, and in private workshops for professional performing artists. He has also created original content and special effects for both motion picture and stage productions.

Leland has a variety of productions and characters that he tours, including his current one-man family show World of Wonder, and his comedy revue Wonderama.

Programs specifically designed for young people have included Urashima Taro an Illustrated Japanese Folktale that premiered at the Kennedy Center, which was so successful it toured for seven years. Additionally, he has toured nationally with his productions, The Rain Forest, and Carnival of the Animals.

Older audiences appreciated Leland's jazz/poetry/theatre project staged around New England called Thirteen Ways of Looking At a Blackbird which was created with a grant from the Maine Community Foundation and in conjunction with jazz composer Steve Grover, (Steve's composition for this production won the Thelonious Monk Award at Kennedy Center). Then there is the ongoing and original production Shadowplay written and produced at Virginia Commonwealth University during his period there as an adjunct professor. In his adopted state of Maine, his seasonal Halloween production of Dark Tales became an annual sold out event at the Celebration Barn Theatre in South Paris, Maine for four years, has played at the Center Stage Theatre in Santa Barbara, California, and will be restaged in October 2012 in conjunction with L/A Arts.

In the early 1990's Leland decided it was time to learn about a subject that has always fascinated and intrigued him, the world of motion pictures, and in August of 1996 Leland graduated with honors from the internationally acclaimed Brooks Institute in Santa Barbara, California. Subsequently he was hired to lecture on the art of editing film for the Hollywood Film Institute, and was the casting director on two films, including the feature Pit Stop. Leland's entry into the CINE film competition with his first student produced motion picture As Luck Would Have It received a prestigious CINE Eagle Award. Following this, his visually rich, animated film, 'The Sky God's Dance', was featured at the Santa Barbara International Film Festival, The One Reel Festival in Seattle, and is often used to open his live family concerts. He won the Maine Film Competition for his short film The King O' Cats. He has been the Director of Photography on the television programs 'Street Safe', and 'Legends of the Gold Coast', has documented artists like Beatrice Wood (104 year old Dada artist) on 16mm film, and has archived various theatres, and performing arts groups. He is proud to have been the tribal video archivist for the native Hutash people of the California coast. For two years he was a key producer and editor for Inside Santa Barbara, a local California TV news magazine. Most notably, he was an artist/consultant to the major motion picture, The Polar Express.



daughter.

His theatre work has had him featured at Arts Carnival in Hong Kong, The Ojai Storytelling Festival in California, the Equitable Center in New York City. an extended tour of Japan for the Kageboushi Theatre Company, a month long, multi-city tour of China with the Wuqiao Circus Festival in 2011, and now in Russia at the Ivhesk International Circus Festival in 2012, to name a few.

Leland currently works as a performing artist, and an independent film maker based in New England, where he continues to develop projects for stage and screen. He currently resides in Maine with the two lights of his life his wife and

## Pre-Show Discussion-Theater Etiquette

Take time before the show to talk to students about the art form of theatre and prepare them for what will happen at the production. Make sure to emphasize what makes theatre different from other kinds of entertainment that they have experienced in the past. Help them realize what a special relationship the audience and the actors have with each other during a live performance.

#### Have you ever seen a play?

Ask students if they have ever seen a play or live theatrical performance before. Discuss what they saw, what

they experienced and how that might compare to attending World of Wonder.

#### What's the difference between theatre and television or movies?

The audience is an important part of a live performance because the actors can see, hear, and interact with the people watching the play. Audience members can show their appreciation by giving the actors their full attention and by laughing and applauding at appropriate times, like at the end of a story or song.

Movies and television shows are filmed. If an actor makes a mistake, the scene can be filmed again and corrected. Since theatre is live, unexpected things sometimes happen. This is part of the fun and excitement of live entertainment.

Plays are performed by live actors. Although actors do their best to perform their part the same way each time they present a play, they can never make it exactly the same every time. Therefore, each performance of a play is unique.

#### What is proper theater etiquette?

Explain what is expected of the students as audience members and discuss proper theatre etiquette as some of them may never have seen a live performance before.

Make sure to remain seated and listen carefully during the performance. This will allow you and the people around you to enjoy the show without interruption. You will have plenty of time to talk to your friends after the show.

Even though you may feel like saying something to the performers, keep your thoughts to yourself. You might disrupt the actors' concentration or disturb other people in the audience if you start talking out loud. Some plays are written for the audience to be a part of the show, but not all. You should participate if, and only if, you are invited to do so by the actors.

Laughing and clapping are encouraged! If you think something is funny, laugh. If you like a story, clap at the end. This is how you let the actors know that you are having fun!

## **Pre-show Activity**

Shadows and Science



Talk about shadows, what are they?

- Where do they come from?
- Are they useful in any way?

Using a single light source as backlight, hang a sheet or paper in a doorway see if you can make the shadow in the picture above.

• Two students step into the frame and change the way they look before stepping into the light. Have the students guess which one it is.

- What is the light source?
- How is the shadow similar to the object you used to make it? How is it different?
- How can you change the size of your shadow?
- How can you change the shape of your shadow?
- How can you change the position of your shadow?
- Hold up ordinary objects, and cast the shadow, see if you can fool the viewers as to what the object is.
- Trace your body shadow, and your profile. Everyone is unique.



#### Changing Shadows During the Day

While students are aware that day and night occur, they may not yet understand that these changes happen because the Earth rotates once every twenty-four hours. Day occurs when our side of the Earth faces the Sun and night occurs when our part faces away. As the day progresses, the Sun appears to follow a path from its rising in the east to its setting in the west. One way to record the Sun's path is to track the shadow cast by a stationary stick. By repeating the experiment periodically over the course of several months, the effect of the time of year on the Sun's path also should be observed. (These two activities are identical, except for the size of the group.) Interesting and important points to understand include:

- The Sun appears to move across the sky due to the rotation of the Earth about its axis.
- The Sun's path for a certain day is determined by the location of the observer on the Earth.
- As a discussion point, imagine you are standing on Everest. Climbers standing at the peak of the highest mountain on earth at sunset make the longest shadow in the world, a shadow that can stretch for miles?

## **Tracking Sun Shadows**

For this activity, first find some open outdoor space - preferably in the school yard - that can be used every day. Be sure to choose a spot unobstructed by trees or tall buildings which would shade this area early or late in the day. When working with older students, it may be preferable to have them work in small groups to record their own Sun shadows (see small group activity below). The small group activity also may lend itself more naturally to long-term observations. If long-term observations are to be made, be sure to record the height of the shadow stick and to use the same one each time. The height will be very important for the activity "Measuring the Earth's Tilt" in Topic 5.

Note: Classes which start observations early in September should be able to include the autumnal equinox (around September 21) in their observations. On the equinox, the shadow ends from the shadow stick will all lie on a straight line. Additionally, an early start allows for the refinement of observing techniques before cold winters arrive to northerly climes.



Be sure to remind students that looking at the Sun can cause permanent eye damage-Never look directly at the Sun!

Possible questions to consider and discuss: What are some differences between day and night? Where does the Sun rise? Where does it set? Where is the Sun at noon? At midday?

Note: Due to daylight savings time, the sun may not reach its highest point in the sky until nearly 1:30PM depending on the time of year and your location within your time zone!

**Materials:** yardstick; large coffee can of soil or stones; large, flat sheet of cardboard or heavy paper (at least 2' x 3'); marker; and compass.

- 1. Begin early on a sunny day and plan to make periodic measurements throughout the day.
- 2. Having selected a suitable spot, use a compass to determine North, East, South, and West. Place the recording sheet of cardboard or heavy paper on level ground such that the edges are aligned with the compass directions. Place the yardstick upright in the large coffee can filled with soil or stones and put this at the center of the southern edge of the recording sheet.
- 3. Mark the direction of magnetic North on the recording sheet. Make sure the students do not move the cardboard, but, just in case, mark the outline of the recording sheet on the pavement with chalk and the outline of the can with a marker, so that their positions may be checked. If permitted, it may be helpful

to outline the chart, or its corners, on to the pavement with spray paint so that observations can be repeated from day to day and week to week.

• 4. Mark the line and tip of the shadow cast by the yardstick with a marker and record the time of the observation. Ask students to predict where the shadow will fall after a certain time interval, such as 15 minutes or an hour. Each student or group of students can mark the place they predict with a small stone or popsicle sticks. When the chosen interval has passed, mark the new shadow position with a marker. The class can check their markers against the actual position.



• 5. Throughout the course of the day, periodically (every hour or half hour) record the movement of the shadow of the yardstick by marking the line and tip of the shadow.

#### Analysis:

After a day of recording, connect the shadow ends recorded near noon time with a line. At Midday, the Sun is at its highest in the sky, and therefore corresponds to the shortest shadow. At this time, the Sun is due South, and so the shadow of the stick points toward the Earth's North Pole. Mark this North-South line. (If not measured, the locations of the noon and midday shadows can be estimated from the positions of shadows marked at nearby times.)

Compare the North-South line marked by the midday shadow with that marked with the compass. Do they agree? Discuss the difference between True and Magnetic North. A compass is simply attracted by the magnetic force. Demonstrate how a nearby magnet can easily fool the compass. Try making it point South by placing a magnet to its south!

If a computer is available, the length of each shadow could be measured and entered, along with its time, into a spreadsheet or graphing program (like AppleWorks, Excel, or Cricket Graph). The computer could make a graph relating the shadow length to the time of each observation. The data for each day could be saved and compared to later days. Even without a computer, a simple graph could be made by hand.

Pose the question, "Did you know nighttime is an enormous shadow?"

#### Day and Night on the Spinning Globe

In the previous activity, students saw how shadows changed during a day. This activity uses a globe and indoor light source to create a classroom model showing day and night on a spinning Earth.

This activity requires a darkened room.

**Materials:** Earth globe with string attached to North Pole; strong focused light source (such as an overhead projector, a flashlight, or a slide projector); golf tees; small figurines; fun tack or similar material.



- 1. Hang the globe from the ceiling, low enough to be reached easily. Shine the light source directly at the globe from the side. The light source must be large enough to illuminate the entire Earth. If you use an overhead projector, you can cut out the "extra" light by placing a sheet of paper on the glass with a hole cut out of its center. While the Earth is actually tilted in its orbit, this is a complication which will not be dealt with until the next chapter on the seasons.
- 2. Attach a small figurine to the globe at your location with fun tack. Slowly turn the globe so that the figurine "sees" the Sun rise in the east and set in the west. Now attach a second figurine to another part of the globe. Does the Sun rise earlier or later in this new location? Are the figurines always both in light or both in darkness? Or can one be in light while the other is in darkness? What if the two figurines were on opposite sides of the Earth?
- 3. Attach a golf tee to the globe at your latitude. Again, slowly turn the globe eastward and notice the fan-like shadow pattern which the golf tee casts. Is it similar to the pattern cast by the shadow stick in the previous activities? Note that the shortest shadow points towards the North Pole.
- 4. Attach three golf tees to the globe at various latitudes along the same meridian of longitude. One should be on the equator, one should approximate your latitude, and one should be near the poles. Ask three students to each observe one of the golf tees. As the globe slowly spins, ask the students to call out their golf tee- "top", "middle", or "bottom"- as they cross the day-night boundary. Also, be sure to observe the midday shadows and to note in which direction they point.

#### Discussion:

How do we know if we're spinning the globe in the right direction? Where does the Sun rise if we were standing on the globe? Where does it really rise? Set? What if we spun the globe in the other direction? Would this also match our observations? It is only by such comparisons with observations that we can verify our models. Are the golf tee shadows longer or shorter at the equator? What about at noon, when the Sun is highest in the sky? Is there any shadow at the equator? What about at your latitude? Where do all the shortest shadows point? Does the pattern made by the golf tee reasonably match that made by the shadow stick of the previous activities? Might a spinning earth, then, not be a reasonable model for the passage of day and night? What if the Earth didn't rotate? What if the North Pole were pointed towards the Sun? Where would it be day and night? Would all locations still have both day and night?

Can you think of any other ways to test this model of a spinning Earth? Maybe shadow stick patterns from schools at other latitudes could be compared to yours. Are they consistent with the differences seen on the spinning globe? Have the students observed any complications which our model does not account for?



#### World of Wonder

#### Post-Show Activities

Objectives: Student will learn about shadows, create shadows, analyze and reflect on their experience of seeing a live show, reflect on the skills and abilities of theatre, and learn about origami.

#### **Class Discussion Questions:**

Which part of the *World of Wonder* did you like best? Why?

What did you think about the actors and how they portrayed their characters?

What did the music/sound in the World of Wonder add to the atmosphere of the show?

Comment on the skills of the performers. How long do you think it would have taken them to prepare and practice the show?

Were there any parts of the show that you did not like? Why?

Compare *World of Wonder* with other live performances you may have seen. Give the *World of Wonder* a mark out of 10. Explain why you gave the performance the mark that you did.

## **Post- Show Survey**

Since attending World of Wonder at the Arcata Playhouse, do you think you would enjoy creating or writing your own show to perform someday?

Describe your favorite part of World of Wonder:

Would you like to attend another show at the Arcata Playhouse?

Write one word the best describes your experience at the Arcata Playhouse:

Write one word that best describes how you feel about live theater:

### **Investigating Shadows**

#### Summary

In this two-session lesson, students investigate the properties of shadows. Through a series of hands-on activities, they will become familiar with the formation of shadows and understand that the shape and length of shadows are dependent upon the position of the light source. In Part One, students discover how the angle of a light source affects an object's shadow. In Part Two, they explore multiple light sources and the distance between the object and the light source.

#### **Materials**

#### Flashlights

White paper or graph paper

Objects of different shapes and sizes (blocks, balls, corks, fruit, action figures, etc.)

Measuring tapes or rulers (optional)

Background for the Teacher PDF

Images – Juan Sanchez Cotan Quince, Cabbage, Melon, and Cucumber

#### Glossary

Angle – The space between two lines or planes that intersect.

Ray – A thin line or narrow beam of light.

Shadow – The image cast by an object blocking rays of light.

Variable – A part of an experiment that can be changed or altered depending on what is being investigated.

#### Preparation

#### Part One:

- Students will need to be assigned to groups of approximately four students each.
- Print the above image onto an overhead transparency

#### Part Two:

• Students need to project their shadows onto a "screen" of white paper. You can either find space on a wall for each group to attach an 8" X 11" piece of paper or clip the paper to stiff cardboard and prop it up against a stack of books.

#### **Procedures**

#### Part One: Introduction to Shadows

- 1. Start a class discussion to find out what students already know about shadows. Where have you seen shadows? What causes a shadow? Do shadows always look the same?
- 2. Give each group of four students a flashlight, a piece of white paper, and an object. Give the students approximately 5-10 minutes to explore and investigate shadows using these items.
- 3. After 5-10 minutes, have each group report their observations and discoveries to the rest of the class. Record each group's ideas on the board or chart paper.
- 4. Challenge the students to think about what controls the length of an object's shadow or what causes it to move from one place to another. Have you ever noticed that your shadow looks longer or shorter at different times of the day?
- 5. Pass out four additional sheets of white paper (or graph paper) to each group. Explain that they will now experiment with the position of the flashlight above the object.

- 6. Have the students place a piece of paper under their object and shine the flashlight directly over the top of the object. They should use a pencil to trace this shadow on the paper and label it "overhead".
- 7. Have them place the object on a new piece of paper and increase the angle of the light source by moving the flashlight slightly downward, toward the surface of the table. Have them trace the shadow and label this paper "angle 1" (or other appropriate label).
- 8. Have the students repeat these steps three more times while continuing to increase the angle of the flashlight until the light is eventually perpendicular to the object. Be sure to have the students trace the outline of the shadow at each stage and label the shadows "angle 2 ...3...4". You may also want students to shade in the darker and lighter areas of each shadow accordingly.
- 9. When the groups of students have finished, ask them to put their traced shadows in order from "overhead" to "angle 4" and look for any trends. Ask them to look at the shortest and longest shadows. What was the position of the light when these shadows were made?
- 10. Have each group come up with a "rule" that explains how the angle of the light source affects the length or type of shadow produced. If needed, allow the groups to use their materials again to test their rule. Have each group share their ideas and discuss the findings as a class.

#### Part Two: More About Shadows

- 1. Begin with a review of the previous lesson. Remind students of how the angle of the light source affected the length of the shadow. Challenge them to think about how the distance between an object and a light source might affect the shape of the shadow.
- 2. Give each group several pieces of paper, an object and a flashlight. (Note: the students will project the shadows onto the white paper "screen" they will need to attach the paper to a wall or prop it up.)
- 3. Give the groups 5-10 minutes to investigate on their own. Ask them to experiment with the distance between the light and the object (move the light closer to or farther from the object) and the distance between the object and the screen (move the object closer to or farther from the screen). After a few minutes, give each group an additional flashlight and ask them to explore what happens to the shadow when they shine more than one light source on the object.
- 4. After 5-10 minutes have the groups share their findings. When was the object the clearest? When was it the fuzziest? Did you notice anything about the size of the shadow? What happened when you used more than one flashlight?
- 5. Explain that the students will now choose a variable to investigate in the next activity. Remind students why it is important to change only one variable of an experiment at a time.
- 6. Have each group choose from one of the following investigations:
  - a) The distance between the object and the screen.
  - b) The distance between the light source and the object.
  - c) The number of light sources.
- 7. Each group should place their object on a flat surface and shine the flashlight behind the object so that it projects on the paper. They should trace and shade in the shadows of their object. (The students will need to use a new piece of paper for each shadow.)
- 8. Groups investigating the distance between the object and the screen should begin with the object close to the screen and move it progressively farther away (5 cm at a time works well). They should measure each distance and use this information to label each shadow.
- 9. Groups investigating the distance between the light source and the object should begin with the light source close to the object and move it progressively farther away (approximately 5 cm each time). They should record each distance and use this information to label their shadows.
- 10. Groups investigating the number of light sources should begin with one light source and then add additional sources one at a time (up to three flashlights). They should label each shadow according to the number of flashlights.

- 11. When the groups are finished, ask each group to present its findings to the rest of the class.
- 12. Ask students what other questions they have about light. Record these questions on chart paper for future investigations.

#### Extensions, Session One

Mathematics: Have the students measure the length of each of their traced shadows and make a graph comparing the angle of the flashlight and the length of the shadow.

Mathematics: Have the students measure or trace their own shadows outside during different times of the day. Compare these results to those in the flashlight activity.

Visual Arts: Show the students the artwork by Juan Sanchez Cotan and discuss where the light source is in the painting and its angle. Choose one or more of the objects from the above activity. Place the object in the center of the room so all of the students can see it. Turn off all of the lights and position a flashlight so that it creates a shadow. Hand out a piece of white construction paper and a pencil. Have the students complete a still life of the object, paying particular attention to the shades of gray in the shadow.

#### Extensions, Session Two

English-Language Arts: Have groups prepare a poster explaining the outcomes of their investigations and give presentations to the rest of the class (or another class).

Mathematics: Have students measure the heights of the shadows they created. Make a graph using 2-D coordinate grids of shadow size vs. distance.

Science: Have students design and perform additional experiments based on their questions about light and shadows. Hold a "Light Fair" to showcase their results.

#### **Teaching Tips**

- Remind students to turn off the flashlights when not in use.
- If there are not enough flashlights for groups to conduct the multiple light source investigation, this portion of the lesson can be done as a demonstration or class activity.
- If the students have difficulty measuring distance, pre-mark the desired distances on the rulers using pieces of colored tape.

#### Bibliography/Webography

Teachers

**Rutgers University** 

http://www.physics.rutgers.edu/hex/visit/lesson/lesson links1.html

List of elementary school science lesson plans

#### A to Z Teacher Stuff

http://www.atozteacherstuff.com/Themes/Shadows Light/index.shtml

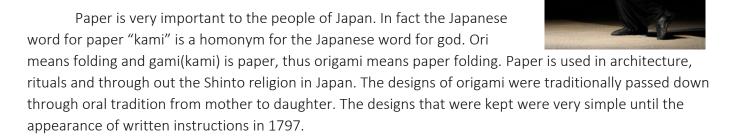
BBC School

http://www.bbc.co.uk/schools/scienceclips/ages/7 8/light shadows.shtml

Wonderful interactive where students can explore the effects of light and shadow. There is also a small quiz at the end.

## Paper, Origami, and Papiroflexia

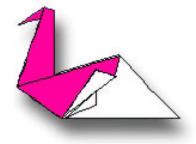
Paper has influence the development of humankind in amazing ways. Most modern civilization would not exist without the invention of paper. Although paper is used in recording and sharing information it is also a visual tool for artists, and architects. In the first century AD paper was invented in China and ever since people have been folding it into various shapes. While the Chinese were the first to craft objects from paper, the Japanese have integrated paper folding into their culture.



The Moors in Spain also developed paper folding. Since the Muslim religion prohibits representational figures, the Moors created very interesting and unique geometric designs. When the Moors left Spain the art of paper folding stayed, eventually developing to papiroflexia. The ancient art of paper folding continues to evolve today. New designs and methods are always being invented, proving that not only is origami a historical and cultural phenomenon but also a living and viable art form.

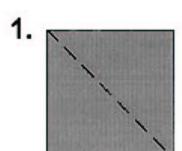
There are many books and resources available on origami, but here is one my favorite simple folds that anyone can do.

Easy Origami Swan

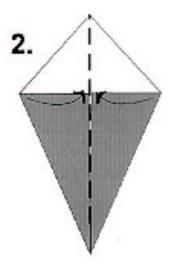


Follow These Simple Steps to Make a

#### **Beautiful Swan**

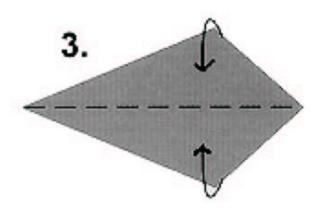


1.Start with a square piece of paper. Fold in half diagonally and crease. Turn over.

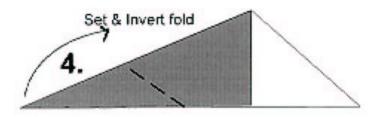


2. Fold corners to center line and crease.

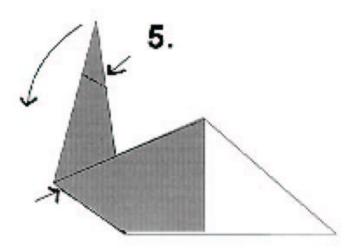
Turn over.



solid edges are together.

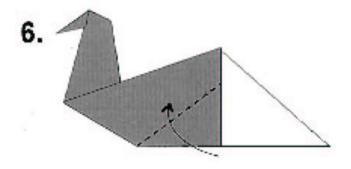


4. Fold narrow point upward at 90-degree angle to form neck and crease. Invert fold so neck is inside body.

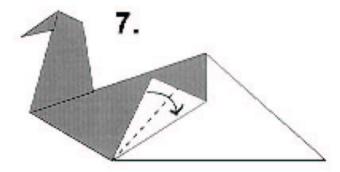


5. Fold point downward to form head and crease.

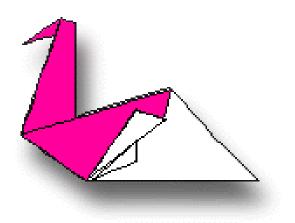
Invert fold so head is inside neck.



6. Fold up flap to form wing.



7. Fold half of flap back down.



Beautiful!