

Orville and Wilbur Wong and the Fantastic Flying Machines

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Overview: The cultural contributions of Chinese immigrants to this country will be explored, leading to a better understanding of cultural diversity. The avenue for investigation will be through literature with connections and extensions into mathematics, science and social studies. Students will become familiar with cultural differences between Chinese and Americans. This will lead to a better understanding of cultural diversity. Students will keep a journal of cultural differences and vocabulary as they read the book *Dragonwings*. Students will complete a culminating project using web research on culture differences and compile the information into a written report. In addition to the language arts study and project regarding the book *Dragonwings*, the students will also explore, investigate, and learn about the principles of flight. The students will be utilizing the Internet to learn about flight as well as build demonstrative models of their chosen principle.

(Some teachers may remember seeing a version of this lesson from the NTTI 2000-2001 collection. Because of the push and interest to tie subjects together in a unit of study I have gone back and retooled this lesson. At the time I wrote the original about the book *Dragonwings* I wanted to add a science lesson. I choose not to do so due to time constraints, and the length of the lesson. Since then I have seen more and more of a push in public schools to tie core subject areas together into one unit of study. Language arts is most often coupled with social studies and science with mathematics. But this lesson lends itself perfectly to a different sort of marriage. Hopefully, you will find the combination of the two different subject areas as interesting as I did. This is a very long lesson to do in its entirety so the teacher may take the parts that are useful. If done with the science component this would cover both subject areas at one time. I hope your students enjoy the combination.)

Grade Levels: 5-7

Subject Matter: Language Arts and Science

Length of Lesson:

For the language arts component:

60-90 minutes for introduction lesson

6, 60-90 minute class periods





For the science component:

6, 60-90 minute class periods

Learning Objectives

Virginia Standards of Learning can be found at: www.pen.k12.va.us

In Language Arts, the student will be able to:

-  explain the term cultural diversity
-  read and learn the meanings of unfamiliar words (Va. SOL English 4.1, 5.4, 6.3)
-  demonstrate comprehension of a variety of printed materials and read a variety of fiction (Va. SOL English 3.5, 3.6, 4.4, 4.5, 5.5, 6.4, 6.5)
-  use the World Wide Web, video of *Dragonwings*, and the novel *Dragonwings* by Lawrence Yep, to write a report on a topic involving cultural diversity. Students may choose within the general topic of cultural diversity such topics as: Chinese contributions, trials and tribulations, or other themes of related interest. (Va. SOL

English Writing 4.7, 4.8, 5.7, 5.8, 6.8)(VA SOL Research 4.9, 5.8, 6.9) (VA SOL Computer/ Technology C/T5.3, C/T5.4.)

Media Components:






- Read On: Cover To Cover #115, *Dragonwings*, Instructional Television video. Check local broadcast times and request in writing that your media specialist tape this episode.
- Please see sheet of web site addresses at the end of this lesson.
- TV/VCR
- Overhead projector, projector screen or pale area for projecting image such as white wall or sheet of paper.
- Computer lab with access to the World Wide Web (The best possible situation would be to have one computer per student, however the lesson can be modified to allow students to complete work individually on a lesser number of computers). To the teacher, please remember that with a limited number of computers the lessons for both the language arts and the science components will take much longer than the suggested class times.
- Refer to attached sheet of recommended web sites for both the language arts and science components.

Language Arts Component:






Materials and Teacher Preparations

Prior to this lesson, websites should be bookmarked on student computers. These bookmarked sites are where the students will go to do their research. Please refer to the section on web sites. The online activity is described in the section labeled as Focus for Online Activities.

For the teacher:

-  One classroom set of *Dragonwings*, minimum of one book for teacher to read aloud to class.
-  A teacher prepared visual of Chinese writing. Example is attached at end of lesson. May be transferred to overhead transparency.
-  Overhead marking pen.
-  Magic marker pen in choice of colors
-  Masking tape or push pins

For each student:

-  strips of red paper 3"x 36" (bulletin board paper cut into strips works well) 2 for each student. One strip will be for practice. The second one will be used for the final completed strip
-  black tempera paint or black ink, individual containers for paint or ink one for each student, watercolor brush for each student, 1/2". Containers of water to clean brushes
-  plenty of paper towels
-  Student copies of Chinese characters page
-  Each student should have a notebook in which to keep cultural points along with new and unusual vocabulary while reading *Dragonwings*. The notebook should be divided into four sections, one for vocabulary, one for cultural facts, the third for facts gleaned from the online research, and the last for the science research.

Note to teacher: The students can make kites that can be used to display their kite tails and poems. This is an optional project. It could be used as a fun activity to look forward to after all the lesson work has been completed. In the web application section, the teacher will find a site that provides great directions for making a kite that really flies.

Preparations for the teacher:

Make sure students understand the term “cultural diversity” and how differences and similarities play into diversity. The students should also understand the word “redemption.” Set aside some time for students to use dictionaries to look up these terms. These two terms should be the first entries in the student’s notebooks. Have the students write the terms and the definitions in the notebook section for vocabulary. Conduct a short discussion to check for student understanding of the terms.

Introductory Activity: Setting the Stage

1. Have students pass out materials for each student; 1 copy of Chinese numbers, 2 strips of red paper, ink or paint, water, brush, pencil and plain paper.
2. Begin with having the students write a number that they select on plain paper. This number can be their age, day’s date, or birth date just to name a few examples.
3. Ask students to identify 3 distinct characteristics about English lettering and numbering. (Possible student responses may be that we write from left to right , in a straight line, our letters and numbers are made up of mostly circles and straight lines).
4. Point out to the students that different cultures have various writing styles. Some have characters instead of letters, some use picture writing as in American Indian writing, and Egyptian hieroglyphics. Show the students the example of Chinese writing. A sample is included with this lesson. Point out the way Chinese characters are made up of more than one line. This is one similarity with English. A difference is that their characters are often very complex. (use the example to point this out). At this give a brief explanation on how the Chinese numbering system works. There is an explanation with the pages of Chinese characters. Ask students to find the corresponding Chinese character for their chosen numbers. The students may have to do some exploration to put the corresponding Chinese number together. The students should underline each character on the Chinese character sheet.
5. Have students practice drawing the Chinese characters of their number on 1 strip of red paper with brush, using ink or paint.
6. After the practice, have students check their attempts to see if they can be improve a little. Have the students complete their final copy on second piece of red paper. When complete put aside to dry. These will be the tails for the kites that the students will make at the end of the lesson.

Learning Activities:

Focus for Media Interaction: Say to the students: “We have been talking about some cultural differences between America and China. Today we are going to start a book about a young Chinese immigrant. Through his experiences we will learn about cultural diversity. We are going to explore differences in people from other parts of the world, particularly China and America in the late 1800’s to the early part of the 1900’s. Now we are going to watch a video segment that will show a part from the book *Dragonwings*, which is our next class novel study. As you watch this video I want you to look for cultural elements. At the end of this viewing you should be able to address the cultural

differences regarding the contrast between the two cultures. Be prepared to point out contrasts that you see between the two families, the Chinese father and son, and the American aunt and niece.

1. With the video in the VCR **Fast Forward** *Cover to Cover Dragonswings #115* to the book with the red cover titled *Cover To Cover*.

2. **Focus for Media Interaction:** Tell students to watch for mention of the contributions that the Chinese have given us. **Play** the video. **Pause** after the narrator says, "Then they taught us to do it." Ask: "What are the contributions that the Chinese made?" (Answers: studied the winds, designed light weight flying designs, built kites and became experts at flying kites, then taught us how to fly kites)

3. **Focus for Media Interaction:** Say to students: "In the next section of the tape please watch for cultural differences and similarities between the two families on their outing to the beach." **Resume** the tape. **Play** through the picnic scene. **Stop** when father says, "I feel badly in need of some exercise." Say to students: "Tell me a few of the similarities and differences you have noticed so far." (As for differences: the food, meat and rice filled dumplings, sandwiches with fat bird meat, turkey, clothing, As for similarities: picnics, outings to the beach, playing in the water, lemonade and tea, fresh fruit and nuts).

4. **Focus for Media Interaction:** Tell the students to listen and watch for how Robin and Moon Lee are alike and how you and they are alike. **Resume** the tape. **Pause** when the narrator says, "spitting out sea water." Ask the students the question: "How were Robin and Moon Lee alike and how were they like you and your friends?" (They like to fly kites, play with friends, and argue with friends, like the beach, like picnics, like family activities and spending time together).

5. **Focus for Media Interaction:** Say: "Students in this next section watch closely and see if you can distinguish between the cultural attitudes in the two families." **Play** video and **Pause** after the narrator says, "He put the string between his teeth and unfolded his blade." Ask: "Did you see any differences in attitudes between the two families?" (Answers: how stars are thought of as dragon eyes watching us from above, sunsets are the same, enjoyment of peace and beauty, attaching a kite's tail after having already flown it without one--in USA we mostly fly kites with the tails attached first). If students did not notice the remarks about dragon eyes watching (referring to the stars), **Rewind** and **Play** the section about sunsets and black sky again. Repeat question or rephrase if necessary. **Pause** at same spot with the father having the string in his teeth and unfolding the blade. Rephrasing the question ask students, "Did you notice any thoughts that both families agreed on or differed on?" (Answers dragons watching instead of stars, enjoying sunsets)

6. **Focus for Media Interaction:** Ask: "Did everyone notice that Windrider had his knife out? What do you think the father is going to do with the knife?" Accept all responses. (Answers may include cutting the string, destroying the kite). Tell students to watch for different attitudes in this next section of the tape. **Resume** the video and **Pause** when Windrider says, "What I make one day I do again." Ask:

“Students what did father do with the knife and why?” (Answers: He cut the string and let the kite go. He set the kite free because its home was the sky and it should not be tied to the earth. To fly free is more important than owning a kite.) Ask the students: “What do you think father meant by the statement, “What I make one day I do again”?” (Possible answers may be: Beauty should be free and kites are replaceable, or Beauty is in the eye of the beholder. Accept answers that students can support with reasoning.)

7. Focus for Media Interaction: Say to students: “In this last section of the tape I want you to pay attention to the discussion of dragons and the comments about redemption.” **Play** the tape. **Stop** the tape when the narrator the says, “and gave him some of the most valuable information he could have ever gotten.” Ask the students: “Why was it important for Windrider to redeem himself?” (Answer: So he could return in the next life as a dragon.) Ask: “What was the difference in cultural attitudes and beliefs about dragons?” (Answer: Chinese believed dragons to be true mystical and magical beings, and great flying creatures. They were believed to have had influence and interaction with Chinese life.) Allow time for class discussion on this topic with the inclusion of redemption. Prompts to encourage discussion: While the meaning of redemption is the same for both cultures, how does redemption differ with the Chinese and Western view? (Discussion may go in the direction of reincarnation as well as other subjects. Western world sees afterlife without reincarnation. What are some different ways people redeem themselves? Are there degrees needed for redemption?)

Culminating Activities: Language Arts

Day One

If class time allows, have students write poems about redemption and/or what special thing they might do to redeem themselves in another person’s eyes. If class time does not allow for the writing of the poems have the students accomplish the poems for homework to share the following day.

Culminating Activities:

Day Two

To the teacher: In this section of the lesson, the activities address the learning objectives for reading and English.

1. Start the class with the reading of *Dragonwings*. Read the first chapter aloud, with either the students or the teacher reading aloud. Students should have their notebooks with them, taking notes on cultural points and new vocabulary. (Suggested vocabulary for chapter one: Middle Kingdom, Land of the Golden Mountain, lynched, dynasty, heirlooms, and phoenix). At the end of chapter one have students make notes about interesting facts and add vocabulary to the appropriate sections of their notebooks.

2. Go over the student’s pre-written poems that were done prior to Day Two.

Day Three

1. Have student’s retrieve their red kite tails and write their poems on the side opposite of their numbers. Set the tails aside. *Note to teacher: It may not be feasible for the*

poems to be written on the tails. This is especially true if the poems are long. If the poems are too long for the tails the poems can be written on a separate sheet of paper. If kites are to be made at the end of the culminating activities the tails can then be attached to the kites.

Days 4-6 (or longer if only one classroom computer is available)

1. Students should continue with the reading of the book *Dragonwings*. During the reading they should be jotting down notes and challenging vocabulary. The vocabulary should include the written definitions.

To the teacher: Culminating Activity--Computer Research

In this section of the lesson the students will be addressing the VA Standards of Learning that refer to using the World Wide Web, Writing, Research and Computer Technology. Say to the students: "Now that we have gotten started with the book *Dragonwings*, we are going to start researching Chinese immigration at the turn of the 20th century. I want you to be thinking and looking for the differences between the Chinese immigrants and the Americans. You may acquire facts from any of the bookmarked sites. You may also use information about Chinese immigrants in different parts of this country at that time. Be sure and record your information in the fact section of your notebook. Also be sure to write down where you found it. This means write down the website address where you collected your information. Remember you will need these facts, with the appropriate addresses, later to write your paper."

1. Having already bookmarked the sites, give the list of sites to the students. Allow them to start their information collection and searches.

2. Remind students they must stay within the bookmarked websites. If one website does not seem very informative or it is busy, they should go to another site on the list.

3. Circulate around the lab making sure students are where they are supposed to be and not having difficulty.

4. Allow as much time as possible for their information searches. This part of the lesson may actually take several days. In the case of using one classroom computer, expect the research component to be completed using more time. Set a reasonable amount of time for all students to retrieve information.

5. After students have completed the entire information gathering, the students write their reports. The report should focus on the comparisons of the cultural differences between Chinese immigrants and American citizens between 1890's and 1910. This paper may also include discrimination, legal problems, religion, family life, etc.

6. After writing and editing the report, students should use a computer word processing program such as Microsoft Word or Applesworks to produce the final report.

ASSESSMENT

Students will be assessed on their notebooks, and the compilation of research information and facts from the World Wide Web. The written report will be the final assessment for

this lesson. The report should be judged for accuracy, completeness of research and on the clarity of their comparison of the two cultures.

Suggestions for follow up activities

Language arts

1. Students will compile all successfully completed reports into a bound volume, complete with pictures of their kites (if they made kites), examples of Chinese brush writing, and poems by the students. This volume makes a nice addition to the class library or even a nice addition to the school's library.
2. A member of the local Asian community could be invited to talk to the class about the differences in America and China.
3. A Chinese Brush Painting artist could be invited to the class to demonstrate and talk about the art medium.

Cross Curricular Extensions:




Math: Students can make Chinese Tangrams.

Art: Students can explore Chinese brush painting. They can also explore and experiment with traditional Chinese paintings that have poems written on the paintings as part of the art piece. Upon completion of these activities, the students might produce their own.

Science Component Lesson

Objectives:

In Science the student will be able to:

-  Demonstrate their understanding of one principle of flight.
-  Demonstrate their understanding of one principle of flight by writing a one page report explaining in detail the principle they have chosen to study.
-  Demonstrate their understanding of the chosen principle by building a representative model.

National Science Education Standards are met with this lesson.

CONTENT STANDARD B: Physical Science

1. Properties and changes of properties in matter
2. Motions and forces
3. Transfer of energy

CONTENT STANDARD D: Science and Technology

1. Abilities of technological design
2. Understandings about science and technology

CONTENT STANDARD G: History and Nature of Science

1. Science as a human endeavor
2. History of science




Science Process Skills

Predicting
Observing
Measuring
Making Models

National Educational Technology Standards

Basic Operations and Concepts
Technology Research Tools

Science Component Materials:

-  Additional writing materials for their science work on flight.
-  4th section of their Dragonwings notebook marked and divided for computer research.
-  Necessary materials to build their flight models. This will vary depending on their models. Materials requirements should be handled in the same way other science projects are managed. This may be materials supplied by the school or by the students.

Learning Activities:

Day One

Introduce the work with the following:

Say to the students, “We have been reading the book *Dragonwings* and if you will remember, there is a lot of interest in flying objects; kites and bi-planes. Think back about Wind Walke4 and his love of flight. He builds magnificent kites and dreams of flying. He is also fascinated with the work the Wright Brothers are doing and tries to read everything there is to know about the bi-plane. Studying flight at the same time we are working on the unit on *Dragonwings* will make both subjects more interesting.”

Explain to the students that they will be investigating the principles of flight.

Tell the students, “I have a list of web site addresses I want you to use to do your research.”

Directions:

1. Say, “First you will need to explore the principles of flight.” Explain to the students that they will be going to the site at the National Air and Space Museum.

<http://www.nasm.si.edu/galleries/gal109/NEWHTF/HTF030.HTM>

Say, “You will work your way through the section, *How Things Fly*. You can do this by clicking on the middle button. From here you just click the next button. At any point you can stop and explore some of the added features of the page then just resume. You journey through the site by using the next and back buttons. When you get to the page that is titled *Airplanes* you need to work down the list of choices starting with *Winging It*. This will be enough information to get you started.”

This site gives students lots of information on the various principles of flight. Say, “After reading about each principle you are to pick one that you want to do a report on. After you have decided which element you would like to work on come and tell me what principle you have chosen. I need to approve your choice. We do not want everyone doing the same principle so I will limit the number of students who work on each

principle.”

2. Say, “After you have your principle of flight approved start your investigation. You may go to any of the sites on your web site address sheet.”

3. Next say, “You will be presenting your reports to the class, therefore your report should consist of enough information that you can explain the principle to your classmates. They must be able to understand it based on your report.

4. Say, “The second part of this assignment is to build a model of a flying machine that will demonstrate your principle. Again after you have decided on your model check with me for approval before starting the building. The choosing of your model does not have to be made the first day. By the end of day 2 with the computers, I want to have all choices recorded. Keep in mind that the model will also be part of your oral presentation. The combined time for your oral report and model explanation can be no longer than 5 minutes. Five minutes is the maximum time. Three minutes will be the minimum time for your presentation.”

5. Give the students the rest of the class period to work on their assignments.

Day 2

Students will work on the computers getting the information they need as well as deciding on their model choices.

Day 3

This session consists of more computer research. Building of the models should start today, in order to have enough time for completion.

Day 4-6







The writing of their reports and the building their models should take place on these days.

Days 7 and 8

The presentation of student reports and projects to the class should take place on these days. There should a 3- 5-minute limit on their presentation times.

Assessment:

Did the student’s report demonstrate the following;

-  Was the topic well researched?
-  Was it presented in an organized manner?
-  Did the student speak clearly and loudly enough for every one to hear?
-  Did the report thoroughly explain the chosen principle?
-  Did the model demonstrate the principle?
-  Was the model carefully made or was it a rush job?

Community Connections

1. Students could visit a local airport. Have a pilot or flight instructor show them a small plane and explain the different parts of the plane.
2. Invite an engineer to the class to discuss the principles of flight.

3. Invite a pilot to the class to talk about careers in aviation.

Web Site Addresses:

Teacher resources:

<http://www.sdcoe.k12.ca.us/score/drag/dragtg.html>

This is a site with a teacher's cyber guide to the book Dragonwings. The site is a wonderful rich resource site for teachers. Their teacher resource site is great for all core subject areas. This is a site worth keeping.

Research:

Language Arts component:

<http://nuevaschool.org/~debbie/library/cur/20c/turn/sup/tline.html>

A very interesting site concerning the turn of the century.

<http://www.sfmuseum.org>

This is a site maintained by the San Francisco Museum. It is an interesting site that covers the San Francisco Great Fire and Earthquake.

<http://www.mandarintools.com>

This is a very interesting site where one can have an English name translated into a Chinese name. Fun and informative. The Mandarin tools site has loads of information. Anyone interested in this subject will find it hard to tear yourselves away from this area!

<http://askjeeves.com>

A great research site for kids. This site makes hunting for information in any subject easy.

<http://www.homeworkspot.com>

This is a good research site that should have a permanent bookmark on every student's computer.

Science Component Web Sites:

<http://www.luminet.net/~bkuhl/Dart.htm>

This is an educational site for the Academy of Model Airplanes and Sig Manufacturing. There are great model airplane plans at this site. Worth checking out. Permission granted for free use for educational purposes by site's designer Bill Kuhl. He would love to have feedback from folks who use the site. He has an email link at the site.

<http://www.ueet.nasa.gov/StudentSite/index.html>

Kids will enjoy this site. It is easy to read and has interesting facts. The game site is especially interesting.

<http://educate.si.edu/resources/lessons/sivc/flight/start.html>

This is a site rich for **teacher resources**. It has lessons on different aspect of flight; drag, lift, thrust and weight. The lessons are well done with fun activities for the students.

<http://www.aero.hq.nasa.gov/edu/index.html>

A fun and informative site easy on kids' eyes. Very simple and explains a lot of vocabulary words dealing with flight.

<http://spaceplace.jpl.nasa.gov/make.htm>

Another fun site for kids. There are several models for building that may work for some of the student's reports. As with all NASA sites it is very scientific, accurate and informative.

<http://kids.msfc.nasa.gov/Rockets>

This site explains the elements of flight: thrust, drag, weight, and lift. The students need to click on the picture of the airplane and go to the next page where they will then click on aeronautics. Next click on the 1st line of questions that ask What forces act on a plane? This will give them the explanation of flight and aeronautics.