Session 3

Telling the Story

Acknowledgments

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Session 3

Telling the Story

Objectives

1. Participants will increase their understanding of the characteristics of learning opportunities that are based on an approach that integrates mathematics, science, and technology.
2. Participants will increase their knowledge and skills to lead an outdoor learning experience.
3. Participants will develop the knowledge and skills to produce a video story about a project that will be used in the classroom.

Participants
Up to 25 teachers

Time Required
6 hours

Handouts

- ❑ 1: Sessions 1 & 2 Review
- ❑ 2: Guidelines for Outdoor Learning Experiences
- ❑ 3: Video Story Project
- ❑ 4: Story Project Example

Facilities

- A room with broadband Internet access, a data projector, tables, and space for participants to work comfortably in small groups
- Electricity for participants' computers

Equipment/Materials

- Computer and data projector for facilitator
- Laptop computers with Internet access (1–2 per group)
- Digital cameras per group (optional)
- Chart paper and chart stand per group
- Markers and highlighters per group
- Student Example: Planting a Garden PowerPoint
- Hard copy of PowerPoint thumbnails per participant
- Connecting Kids Video: Student Example: Planting a Garden (optional; http://youtu.be/WqtNnmvS_SE)

Software

- Internet browser
- Microsoft Photo Story 3
- Microsoft PowerPoint

Facilitator Preparation

- Read the session guide and familiarize yourself with the activities and handouts 1–4.
- Preview the Student Example: Planting a Garden PowerPoint.
- Make copies of the handouts and PowerPoint thumbnails.
- Ensure adequate numbers of materials for all participants and groups.
- Prepare a large version of the blank chart in Handout 1 for the whole group to complete.
- Prepare a list of the Session 1 and 2 activities to review.
- Download free copies of Microsoft Photo Story 3 and install on all computers.
- Download and preview a free tutorial on Microsoft Photo Story 3 (http://download.microsoft.com/documents/australia/education/photo_story_3.pdf). Familiarize yourself with the application and be prepared to answer questions about its use.
- Review the BSCS 5Es Instructional Model (see Session 1: Handout 1).
- Review the related Texas Essential Knowledge and Skills (TEKS) Technology Applications standards listed in this document.

Prerequisite Skills of Participants and Facilitator

- Basic computer skills
- Basic understanding of Web navigation
- Basic knowledge of Microsoft Photo Story 3 (facilitator)
- Basic understanding of grade-level mathematics, science, and technology content standards

Grouping Strategy

Use a heterogeneous grouping strategy. Ensure that each group of three to four members includes both math and science teachers as well as elementary school teachers who teach in self-contained classrooms.

Session Sequence

In this activity, participants will engage in the production of a story about a standards-based project that students could produce. The story should be able to be used as an example for students.

Working in heterogeneous groups, participants will explore when it is appropriate to take students outdoors to enhance learning experiences. Still working in groups, participants will then develop an integrated project that will take students outdoors and address some of the mathematics, science, and technology standards that participants plan to focus on during the next grading period.

Engage

Equipment/Materials

- ❑ Chart paper and chart stand per group
- ❑ Markers and highlighters per group

Table Groups

1. Organize participants into heterogeneous groups of three to four members. Plan for a 3-minute transition from whole group to table groups.
2. Ask the groups to list on the chart paper at least three characteristics of integrated learning opportunities and how student learning may be enhanced with outdoor learning opportunities
3. Tell the groups they are going to use a value-added strategy in the discussion of outdoor learning opportunities. Each group will report one characteristic of integrated outdoor learning opportunities without repeating what other groups have already identified. Facilitate the discussion and list the characteristics on chart paper to document them until all ideas have been reported.

   Possible responses may include:
   - Integrated learning opportunities connect the disciplines.
   - Outdoor learning experiences provide real-world examples of how the content areas are dependent on one another.
   - Integrated learning opportunities shift students from learning discrete pieces of information and rote procedures to investigating interrelated facets of the real world.
   - Outdoor learning opportunities provide real-world applications of the content learned in the classroom.
   - Outdoor learning opportunities engage and excite many students.

Explore

Equipment/Materials

- ❑ Chart paper and chart stand per group
- ❑ Markers per group

Table Groups

4. Have participants work in their groups to brainstorm integrated learning opportunities that involve some outdoor experiences. Each group should list at least three examples on its chart paper. Examples include the following:

- Planning and building a vegetable garden on the school grounds
- Traveling to a local community resource such as a museum or nature center
- Designing and building a race track for a pinewood derby car race
- Designing an area for skateboarding

5. Ask the groups to report one or more of the examples they listed. Some participants may have taught integrated units that utilized outdoor learning opportunities before. Ask volunteers to share their experiences with the whole group. Facilitate discussion.

Explain

Equipment/Materials

- ❑ Computer and data projector for facilitator
- ❑ Large re-creation of the blank chart in Handout 1 that the whole group can examine and complete
- ❑ List of the Session 1 and 2 activities
- ❑ Handout 1: Sessions 1 & 2 Review (1 per participant)
- ❑ Handout 2: Guidelines for Outdoor Learning Experiences (1 per participant)
- ❑ Chart paper, markers, and chart stand for whole group

Whole Group/Table Groups

6. Present a large copy of the blank chart in Handout 1: Sessions 1 & 2 Review to the whole group. In addition, give each participant a copy of Handout 1. Orally review the activities in Session 1 (How Old Is Old?). Ask the groups to quickly determine a rating and rationale. Then discuss the ratings as a whole group. Possible answers are provided in Figure 1 on the following page.

   Next, orally review the activities in Session 2 (What Cat Is That?) and have the groups rate them and provide a rationale for each rating. Discuss the ratings as a whole group. Again, possible answers are provided.

   Ask, *"How could a project/unit be improved to include outdoor learning opportunities that increase student understanding of the content?"*

8. Ask, *"How might an outdoor learning experience differ from a field trip?"* Guide the group to understand that an outdoor learning experience is focused on enhancing student understanding of identified content.

9. Ask the groups how they would prepare for and conduct outdoor learning experiences for one of the examples generated in the Explore section. Allow the groups to work together for 10 minutes. Then ask each group to select one person to report for the whole group.

10. Facilitate a whole-group discussion and write the steps for the preparation of an outdoor learning experience on chart paper.

11. Ask the groups for ideas on how to facilitate student groups while they are outside and then when they return to the classroom. Again, list the information on chart paper.

12. The list should include the following plus other key points provided by participants. This list is not comprehensive, so encourage additions.

Figure 1. Sessions 1 and 2 Review: Possible Answers

Session 1: How Old Is Old?	1 – Poor	2	3	4 – Excellent
Includes relevant outdoor learning opportunities that increase student learning	X There are no references to outdoor learning experiences.			
Includes science, technology, engineering, and math			X More science content could be explicitly provided.	
BSCS 5Es Instructional Model utilization				X All phases were well represented.
Session 2: What Cat Is That?	**1 – Poor**	**2**	**3**	**4 – Excellent**
Includes relevant outdoor learning opportunities that increase student learning			X Outdoor learning experiences were built in but without explicit implementation directions.	
Includes science, technology, engineering, and math				X All disciplines were addressed very well.
BSCS 5Es Instructional Model utilization				X All phases were well represented.

Before the outdoor learning experience:

1. Identify a concrete, relevant purpose for going outdoors that will enhance student learning.
2. Inform the appropriate authorities (principal, parents, etc.).
3. Scout the site for possible dangers or impediments to the learning experience. Look for poisonous plants and dangerous insects.
4. Develop roles and assignments to ensure that every student has a responsibility. Some roles may include:
   a. **Supply and Time Officer:** checks out supplies to each group member and checks in all supplies upon return; monitors the time during outing so that all of the data are collected in the allocated time period
   b. **Recorder:** completes data sheets for the group
   c. **Data Collector:** uses recording devices (rulers, thermometers, wind gauge, etc.) and reports data to recorder
5. Hand out data sheets and assign a role/responsibility to each student. On multiple trips, rotate duties so each student experiences every role.
6. Immediately before leaving the classroom, check materials out to the supply and time officer, review the purpose and goal of the outdoor learning experience and how much time students will have to accomplish tasks, and review expected behavior (no running, yelling, off-task behavior).
7. Other preparations: _____

During the outdoor learning experience:

1. Make sure every student has an authentic task to complete outdoors.
2. Bring extra copies of the data sheets and pencils.
3. Immediately redirect off-task behavior.
4. Be visible to all students and insist they remain visible to you at all times.
5. Other considerations: _____

After the outdoor learning experience:

1. Collect checked-out material. Provide group time to complete and summarize data sheets.
2. As a class, discuss questions and what was learned outside.
3. It may be helpful to require every student to write a summary report using the collected data.
4. Other considerations: _____

After the discussion, distribute Handout 2: Guidelines for Outdoor Learning Experiences. Encourage participants to add the ideas shared by the group.

Elaborate

Table Groups

Equipment/Materials

- ❑ Computer and data projector for facilitator
- ❑ Laptops with Internet access (1–2 per group)
- ❑ Digital cameras (1 per group; optional)
- ❑ Microsoft Photo Story 3 Tutorial on each laptop (http://download.microsoft.com/documents/australia/education/photo_story_3.pdf)
- ❑ Handout 3: Video Story Project (1 per participant)
- ❑ Chart paper (for storyboards) per group
- ❑ Markers and highlighters per group

13. Organize participants into heterogeneous teams of three to four members. To the extent possible, group teams by grade level and include at least one math and one science teacher per team. Plan for a 3-minute transition from whole group to table groups. Provide each team with 1–2 laptops with Internet access, digital cameras, chart paper, and markers and highlighters.
14. Share the following information: *"One way to engage students in math and science is to encourage them to use technology to tell stories related to the content areas. Telling the story of an event or process, such as an outdoor learning experience, an investigation, or how to solve a problem, gives students an opportunity to organize information, use their innate creativity, and present what they have learned. The story may be used midway through a unit to assess student understanding or at the end as a final assessment. The important elements to determine are the topic and purpose of the story."*
15. Give each participant a copy of Handout 3: Video Story Project. Ask volunteers to read aloud each part of the handout. Then ask participants if they are clear on the task and the expectations. Answer any questions.
16. For this project, participants will use the free software Microsoft Photo Story 3. Explain that several similar software products are available, both free and commercial. The class is using this one so that everyone is using the same program and because the software is free for use in the classroom. Take about 10 minutes to present the Photo Story 3 tutorial and demonstrate the basics of the software. The demonstration should cover only what the participants need to get started.
17. Give the teams the next 2 hours to work on their projects. Facilitators should spend this time going from team to team to check in and offer assistance where needed.
18. At the end of the production time, ask each team to present its draft video to the whole group by connecting the relevant laptop to the projector. As each group presents, members should also show their written draft, storyboard, resource list, and list of related TEKS.

Evaluate

Table Groups

Equipment/Materials

- ❑ Computer and data projector for facilitator
- ❑ Laptops with Internet access (1–2 per group)

19. Ask each group to develop a rubric that teachers could use with students to evaluate the video story projects.

20. Ask each group to share its rubric with the whole group. Encourage peer feedback and discussion on other considerations that may improve the clarity of the rubric.

Whole Group

21. **Eighth Grade Story Example: Planting a Garden.** Give each participant a copy of Handout 4: Story Project Example. Say, *"We are going to look at an example of what a group of students might produce for a story project. The example would work with either a slide show or video format."* The handout describes the project.

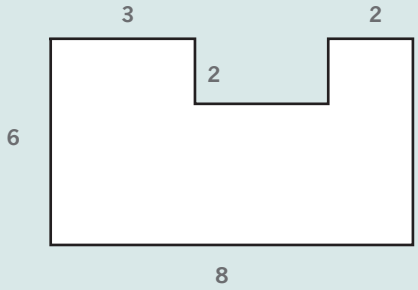
Equipment/Materials

- ❑ Computer and data projector for facilitator
- ❑ Laptops with Internet access (1–2 per group)
- ❑ Connecting Kids Video: Student Example: Planting a Garden (optional; http://youtu.be/WqtNnmvS_SE)
- ❑ Student Example: Planting a Garden PowerPoint
- ❑ Hard copy of PowerPoint thumbnails (1 per participant)
- ❑ Handout 4: Story Project Example (1 per participant)

Handout 4:

Problem: You have an irregularly shaped area where you wish to plant a garden. It is recommended you get rid of the grass and weeds before planting. You need to decide

1. What method to use to get rid of the weeds
2. What materials you will need and how much of them you will need



Task: The numbers on the figure represent lengths in meters. Explain what you need to know to solve the problem. Then create a photo or video story that presents and explains your solution process.

22. Give each participant a copy of the thumbnails for the Student Example: Planting a Garden PowerPoint. Then start the PowerPoint, which presents a student team's story of its solution process. As you move through the slides, share the student narration for the story, as provided in the steps below. Optionally, a Connecting Kids video with narration of this PowerPoint and activity is available at http://youtu.be/WqtNnmvS_SE.

23. **Slides 1–3:** *"We wanted to plant a garden at the school. The principal said we could use an area between some of the buildings. One of the first things we needed to do was to get rid of all of the grass and weeds. Which led to two questions: What should we use to get rid of and control the weeds? How much of the material will we need?"*

24. **Slides 4–5:** *"Our team conducted an Internet search and found five methods for getting rid of weeds: (1) landscape fabric, (2) chemicals, (3) newspaper, (4) burlap, and (5) pulling the weeds by hand."*

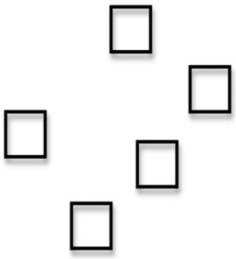
25. **Slide 6:** *"The Internet gave us information about the benefits of each method, but not much on the drawbacks. After some discussion, we decided to test which method would be best. We opted not to test two methods: pulling weeds by hand, because that method would take too long, and chemicals, because students are not allowed to use them."*

26. **Slides 7–8:** *"We needed to obtain three types of materials for our investigation. It would be easy to find old newspaper to use, so that method would be free for us. We called a landscaping business, and they said they would donate the landscaping fabric and burlap to our school. We just had to tell them how much we needed."*

27. **Slide 9:** *"To determine the amount we needed, we had to figure out how to subdivide the area for the garden and then determine the area of each of the subdivisions. Since we needed one plot as a control and three plots as test areas, we needed to subdivide the area into four sections."*

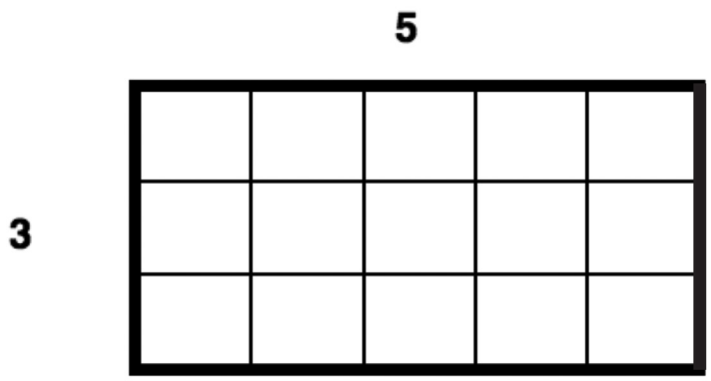
28. **Slide 10:** *"Our team consisted of three students. As a group, we talked about the diagram and saw that it looked like several rectangles put together. But before tackling the problem, we decided we needed to be sure everyone in our group understood how to do this problem. First, we wanted to be sure everyone understood the basic idea of area. We all agreed that area has to do with the amount of surface inside a figure like a rectangle or triangle, such as the areas where we wanted to test the three weed-control methods.*

    "Next, we considered the idea of square units. These units are exactly what the name says—squares. And they need to have dimensions of 1 by 1. So if the length and width is 1 inch each, then the unit would be a square inch. If it is 1 foot by 1 foot, then the unit would be 1 square foot. In our case, we were dealing with meters, so our units for area were square meters—each one a square with the sides all one meter. So in the top figure on the PowerPoint slide (shown below), if all of these are 1 x 1 squares, then the total would be 5 square meters.



    "If we were to take those square meters and line them up and put them together, it would look like the rectangle shown on the slide (shown below). It would be 1 meter wide and 5 meters long, plus it would still have an area of 5 square meters. It looks like you could multiply the length times the width (5 x 1) to get the area, but we needed to be sure of this."

29. **Slide 11:** *"We decided to make two more copies of the same rectangle and combine the three into one figure. Since we already knew that each unit separately was 5 square meters, the new figure probably would be 15 square meters because we put together three smaller rectangles that were 5 square meters each. When we put them all together, it looked like the image on the slide* [shown on the next page].



"We counted up the squares, and there were 15 total, supporting our idea that you get the area of a rectangle by multiplying the length by the width. And from the picture, we knew that there were 15 square units."

30. **Slide 12: "***At this point, we were ready to tackle the problem. We had decided as a group that the key was to subdivide the garden plot into four smaller rectangles. There are several ways to accomplish this task. We began by drawing a horizontal line as shown. The dimensions of this smaller Rectangle A are already known. It has a length of 3 and a width of 2. So Rectangle A has an area of 6 square meters (3 x 2)."* [If the slide show had been done as a video, students could have marked on the drawing as they narrated.]

31. **Slide 13:** *"Next, we drew the vertical segment (green) as shown to create a second small rectangle, which we labeled B. Finding the area of this rectangle was a little more complicated because we first had to determine its dimensions. Horizontally, the bottom length must be the same as the top, already labeled as 3. The width (vertical) of the large rectangle is 6. The vertical width of Rectangle A was 2. Thus, the width for Rectangle B must be 4 (6 – 2). So the area for Rectangle B is 12 square meters (3 x 4)."*

32. **Slide 14:** *"We created two additional small rectangles, C and D, by drawing one vertical segment as shown (blue segment). We knew the width (vertical) for Rectangle C was 4, but we needed to compute the horizontal side length. As you can see, the length of the original large rectangle is 8. The horizontal distance for Rectangle A is 3 and that for Rectangle D is 2, which is a total of 5. So the missing piece has to be the difference between 8, the whole length, and 5, the combination of the two other known lengths. Thus, the missing horizontal length for Rectangle C is 3 (8 – 5). Rectangle C is 3 by 4, so its area is 12 square meters (3 x 4). The dimensions for Rectangle D can be determined directly as 2 and 6, thus Rectangle D has an area of 12 square meters (2 x 6).*

    "The areas for the smaller plots are then as follows: 6 square meters (3 x 2) for Rectangle A, 12 square meters (3 x 4) for Rectangle B, 12 square meters (3 x 4) for Rectangle C, and 12 square meters (2 x 6) for Rectangle D. The total area for the garden is 42 square meters (6 + 12 + 12 + 12)."

33. **Slides 15–16:** *"The next step was to set up each of the test areas with the right material, take pictures, and keep a log for the next 3 months to see which method of weed control was the best. Following this procedure, we decided to cover three of the areas with different types of weed control and did not use any material in the fourth plot to provide a control for the investigation. We decided to use Rectangle A as the control. We planted the same vegetables in Rectangles B,*

C, and D. We then put the fabric over Rectangle B, newspaper over Rectangle C, and burlap over Rectangle D.

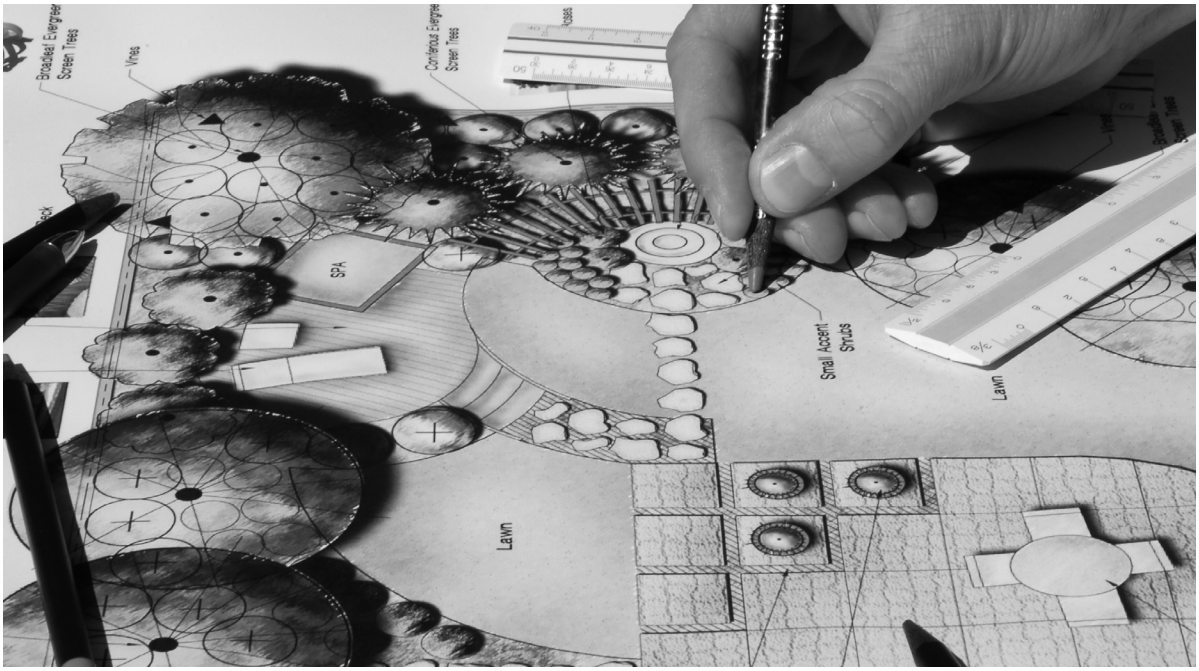
"Once a week, we had to water. In addition, each week we took photos, counted weeds, and logged the results in our lab log. After 3 months, we were able to review the results of the investigation and reach some conclusions about the effectiveness of the three different methods of weed control."

34. Working with the whole group, facilitate participants in developing a rubric that could be used to grade the sample garden project. Discuss the advantages of providing the rubric to students before they begin the project.

35. **Reflection.** Say to participants, *"As an individual, identify when you would be able to build in an outdoor learning experience in your lesson/curriculum. What are some of the anticipated challenges, and how would you address them?"*

Technical Assistance Follow-Up

The technical assistance provider will individually contact the participants after they return to their classes to support implementation of video stories and outdoor learning experiences in their lessons. Ask about anticipated challenges and how participants plan to address them.



Texas Essential Knowledge and Skills (TEKS)

Note, not all grade levels have standards that directly relate to this session. Avoid "stretching" the session to make it apply to TEKS other than those listed below. This effort would not be an appropriate use of the students' learning time.

§111. Mathematics, Grades 4–8.

(b) Knowledge and skills.

(Identified by participating teachers)

§112. Science, Grades 4–8.

(b) Knowledge and skills.

(Identified by participating teachers)

§126.3. Technology Applications, Grades 3–5.

(b) Knowledge and skills.

(1) *Foundations.* The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:

(A) use technology terminology appropriate to the task.

(3) *Foundations.* The student complies with the laws and examines the issues regarding the use of technology in society. The student is expected to:

(A) follow acceptable use policies when using computers; and

(B) model respect of intellectual property by not illegally copying software or another individual's electronic work.

(4) *Information acquisition.* The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:

(A) apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies; and

(B) select appropriate strategies to navigate and access information on local area networks (LANs) and wide area networks (WANs), including the Internet and intranet, for research and resource sharing.

(7) *Solving problems.* The student uses appropriate computer-based productivity tools to create and modify solutions to problems. The student is expected to:

(A) use software programs with audio, video, and graphics to enhance learning experiences;

(B) use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia; and

(C) use a variety of data types including text, graphics, digital audio, and video.

(11) *Communication.* The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:

(A) publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video; and

(B) use presentation software to communicate with specific audiences.

(12) *Communication.* The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:

(A) select representative products to be collected and stored in an electronic evaluation tool;

(B) evaluate the product for relevance to the assignment or task; and

(C) create technology assessment tools to monitor progress of projects such as checklists, timelines, or rubrics.

References

Bybee, R. W., Taylor, J. A., Gardner, A., Van Scotter, P., Carlson Powell, J., Westbrook, A., & Landes, N. (2006). *The BSCS 5E Instructional Model: Origins, effectiveness and applications.* Retrieved from http://www.bscs.org/bscs-5e-instructional-model