

**Session 9**

# **Putting It All Together**



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## Session 9

# Putting It All Together

### Objectives

1. Participants will review key topics, components, and challenges regarding instruction that integrates mathematics, science, and technology.
2. Participants will integrate and apply what they have learned in previous sessions by developing an instructional unit that integrates mathematics, science, and technology.

### Facilities

- A room with Internet access, a data projector, speakers, tables, and space for participants to spread out in groups and work comfortably
- Electricity as required for powering participants' computers

### Equipment/Materials

- Computer and data projector for facilitator (optional)
- Laptop computers with Internet access (1 per participant)
- Chart paper and stand (1 set per school team)
- Chart markers and highlighters (2–3 per school team)

### Software

No special requirements

### Facilitator Preparation

- Before this culminating session, check with participants to ensure they are ready to present the integrated units they prepared in sessions 7 and 8.
- Read the session guide and familiarize yourself with the activities and handouts 1–3. Review Session 1: Handout 1 (BSCS 5Es Instructional Model).



**Participants**  
Up to 25 teachers



**Time Required**  
6 hours

### Handouts

- 1: Key Topics Review
- 2: Integrated Unit Presentations
- 3: Google Groups
- Session 1: Handout 1: The BSCS 5Es Instructional Model

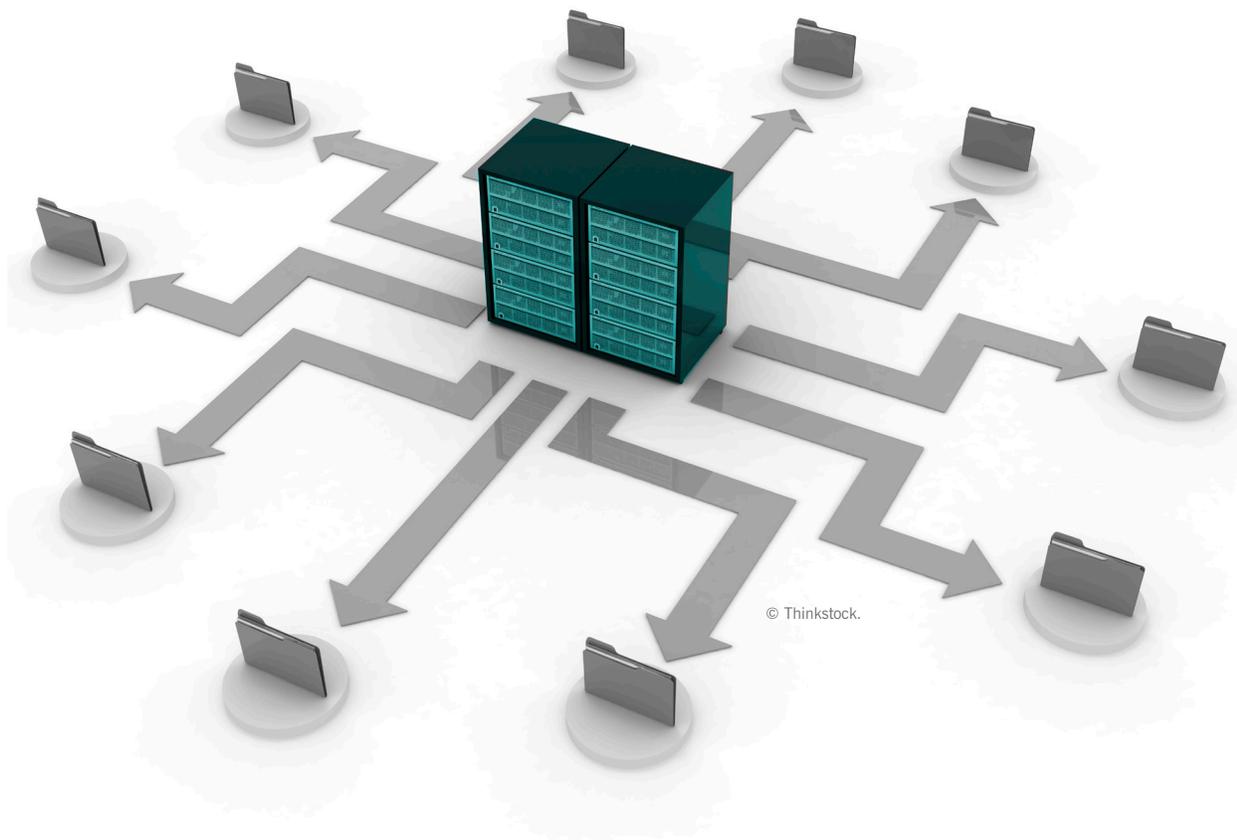
- Upload the following handouts into a folder on Google Docs and invite all of the participants to share the folder.
  - Handout 1: Key Topics Review
  - Session 1: Handout 1: BSCS 5Es Instructional Model
  - Handout 2: Integrated Unit Presentations
  - Handout 3: Google Groups

### Prerequisite Skills of Participants and Facilitator

- Should have participated in all previous sessions and completed development of the integrated unit with their team (participants)
- Thorough understanding of the content and technology in the previous sessions (facilitator)

### Grouping Strategy

Since this is a culminating activity that applies the learning from previous sessions to classroom settings, each group of three to four members should be the same as those who worked together in sessions 7 and 8.



## Session Sequence

In this culminating session, participants will share the integrated units they developed in sessions 7 and 8. Before this session, each school team should have completed the design of its integrated learning unit. Each team should also have taught some or the entire unit to test how well it met the instructional objectives.

During this session, each school team will provide an overview of its unit, and team members will discuss some of their successes and challenges in teaching the unit. Finally, the teams will explore how to use Google tools to continue collaborating within their teams and with the whole group for as long as participants find doing so useful and helpful.

As an extension, it may be beneficial to follow up the sharing session with a mini conference at a school. Teams could present their units to other teachers in the school, district, or region.



### Individuals

1. Ask each participant to download a copy of Handout 1: Key Topics Review from Google Docs. Provide a hard copy of the handout to any participants who do not have access to the site.
2. Ask the participants to answer the questions on Handout 1 individually. Allow approximately 20 minutes for individual work.

### Equipment/Materials

- Computer and data projector for facilitator (optional)
- Laptops with Internet access (1 per participant)
- Handout 1: Key Topics Review (on Google Docs plus extra hard copies for participants who do not have access to the site)
- Chart paper and stand (1 set per group)
- Chart markers and highlighters (2–3 per group)

### Table Groups

3. Organize the participants into the same table groups they worked with in sessions 7 and 8. Provide each team with chart paper, a chart stand, and markers and highlighters. Plan for a 3-minute transition from whole group to table groups.
4. Have team members discuss their responses to the questions on Handout 1. Instruct the members to develop a team response to each question and to write these responses on the chart paper. Give the teams about 20 minutes for this task.

### Whole Group

5. Have each team select a spokesperson. Then call on each spokesperson to report the team's responses to the whole group. To expedite the process, the reporters should not repeat responses already given by previous teams. As part of your preparation, be prepared to add key points not addressed by the teams.



## Whole Group

6. After the whole-group reflection, explain to participants that they are going to begin the team presentations. As a quick review, note that the reflection piece the teams just completed was the Engage portion of today's session. Participants will now move into the Explore and Explain sections.
7. Tell participants, *"While we have modeled the use of the BSCS 5Es Instructional Model in sessions 1–8, following this format exactly is not always best practice. The BSCS 5Es Instructional Model was never intended to be a locked-in regiment that teachers must follow exactly in every lesson. We have followed the model closely to help everyone get used to the concept development format. Refer to Handout 1 from Session 1 to review each part of the BSCS 5Es Instructional Model.*

*In practice, the BSCS 5Es Instructional Model provides a general guideline on how to introduce and develop a deep understanding of a concept. After you have an understanding of each of the components in the model, it is acceptable to make minor adjustments to facilitate knowledge acquisition. In this case, we will use the Explore phase to explore each integrated unit and the Explain phase as an opportunity for the presenting team to explain anything that was not clear to the whole group."*

8. As explained above, in this session you will go through the Explore and Explain phases recursively as each team presents its integrated unit to the whole group.
  - **Explore:** During this phase, a team will present an overview of its unit to the whole group. Participants will listen and take notes on Handout 2 with the explicit purpose of understanding the learning objectives of the integrated unit. Participants will also identify the components presented in the unit.
  - **Explain:** During this phase, encourage participants to ask the presenting team to explain anything they did not understand.
9. **Explore.** Ask the participants each to retrieve Handout 2 from Google Docs. Provide a hard copy to any participants who do not have access to the site. After everyone has the document, remind participants that during each team presentation, their task is to note on Handout 2 examples of the following:
  - Instructional objectives (TEKS)
  - BSCS 5Es Instructional Model format (Sessions 1–9)
  - Video (Session 3)
  - Outdoor learning experiences (Session 3)
  - Web research (Session 4)
  - Assessment rubric (Session 5)
  - Online collaboration (Session 7)
  - Community resources (Session 8)

## Equipment/Materials

- Computer and data projector for facilitator (optional)
- Laptops with Internet access (1 per participant)
- Session 1: Handout 1: The BSCS 5Es Instructional Model (on Google Docs plus extra hard copies)
- Handout 2: Integrated Unit Presentations (on Google Docs plus extra hard copies)
- Chart paper and stand (1 set per group)
- Chart markers and highlighters (2–3 per group)

- 10. **Explain.** Encourage the rest of the group to ask the presenting team probing questions to increase participants' understanding of the implementation and utilization of each of the components listed on Handout 2.
- 11. Ask each team member to explain some of the successes and challenges of designing the unit and then teaching it with their students.
- 12. Repeat this cycle until all of the teams have presented their units.



**Elaborate**

**Whole Group**

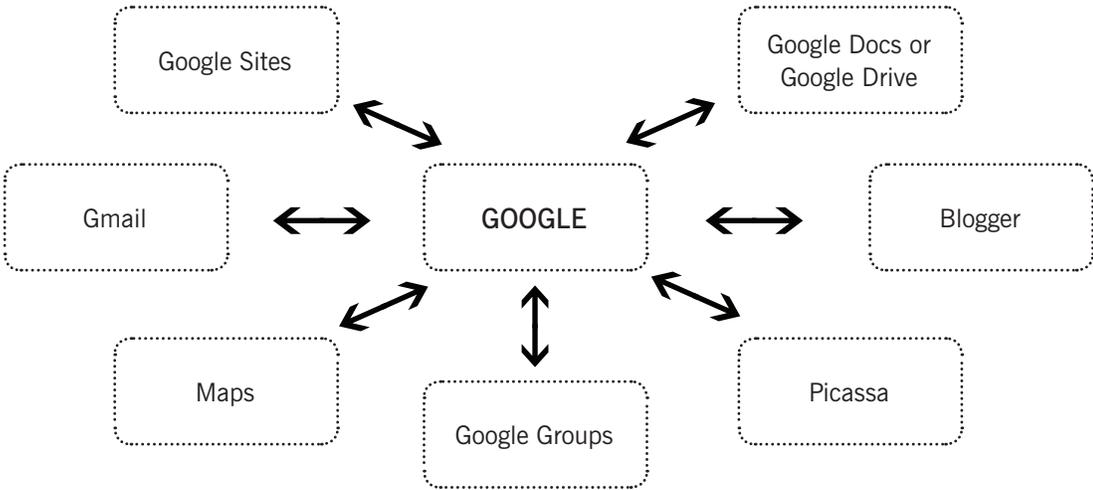
- 13. Explain that participants will now use Google tools to tie together all that they have learned. In Session 6, participants learned how using Google Docs enables them to collaborate in real time with other teachers. In Session 7, participants learned to use the Google tool Blogger to create classroom blogs. In this session, participants will learn how to use Google Groups to share comments and ideas between teachers and students.

**Equipment/Materials**

- Computer and data projector for facilitator (optional)
- Laptops with Internet access (1 per participant)
- Handout 3: Google Groups (on Google Docs plus extra hard copies)

Discuss with the group that just as the garden project was used as a model to illustrate various instructional components, such as exploring community resources, we are using Google tools to provide a model of online tools that can enhance instruction and collaboration. There are many other free tools and resources available on the Internet, as discussed in Session 6. Google tools are not the only resources available, and participants are encouraged to explore other tools, which include Yahoo! Groups, Yahoo! Mail, and MapQuest.

While most participants will be familiar with the Google search engine and tools used in previous sessions, many may not realize the other tools available through Google. By creating a Gmail account, users gain access to a variety of Internet tools ranging from maps to photo software, office tools, and much more. The following provides an overview of these tools.



- **Gmail:** Gmail is a free e-mail service provided by Google that enables users to have an e-mail address separate from their school accounts and provides access to many other tools.
- **Google Docs:** As shown in Session 6, a Gmail account provides access to Google Docs, a suite of tools ranging from text editors to spreadsheets and presentation software. Google Docs makes it easy to collaborate on documents and share them among users.
- **Blogger:** A Gmail account also provides access to Blogger. In Session 7, each school team created a classroom blog to document its integrated unit. As a group, we used the data collection from a garden as a blog example.
- **Google Groups:** This tool is a way to create e-mail lists and group discussion areas. Many community organizations, such as baseball teams, PTAs, and homeowners associations, use online groups such as these to keep in contact with their members. These groups enable users to create a discussion topic and invite multiple members to join in the discussion.
- **Google Sites:** This tool enables users to choose templates to create websites that meet their specific needs. The websites can also be set up as wikis to enable users to share and collaboratively edit information.
- Other useful tools available from Google include the following:
  - *Picasa* – online photo management system
  - *YouTube* – video viewing and storage service
  - *Calendar* – tool for creating personal and group calendars
  - *Google+* – social networking site
  - *Maps* – tool for viewing maps and getting directions

## Table Groups

14. Tell participants, *“It may be helpful to you professionally to continue to collaborate with your colleagues. We will use Google Groups as an example of one method for doing this.”*
15. Ask each participant to download Handout 3: Google Groups from Google Docs. Provide a hard copy to any participants who do not have access to the site.
16. Allow time for the teams to set up their Google groups. Circulate about the room to provide assistance as needed.



## Evaluate

### Table Groups

17. Ask the groups to discuss how they have conducted formative and summative assessments for group projects in the past, including for their integrated units.

### Equipment/Materials

- Computer and data projector for facilitator (optional)
- Laptops with Internet access (1 per participant)
- Chart paper and stand (1 set per group and for facilitator)
- Chart markers and highlighters (2–3 per group and for facilitator)

### Whole Group

18. After 10 minutes, ask the groups to report at least one example of a formative assessment strategy and one example of a summative assessment for at least two of the group projects presented. On chart paper, record the different methods used to assess students informally and formally.
19. Afterward, recap and categorize the assessment strategies. Formal and informal assessments may be categorized in multiple ways:
  - Whole class
  - Group
  - Individual student skills
  - Team or group skills
  - Content development

### Closure: Table Groups

20. Ask the team members to discuss the challenges of developing and implementing integrated units and how they plan to address those challenges after this training series has concluded.

### Whole Group

21. Ask for some volunteers to share their reflections. Encourage everyone to share e-mail addresses and to continue to use the collaborative resources and tools discussed in this training series.

## Texas Essential Knowledge and Skills (TEKS)

The TEKS utilized for mathematics, science, and technology are dependent on the topics chosen by table groups for their instructional units.

## 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.bsos.org/bsos-5e-instructional-model>