INSTRUCTOR GUIDE

SESSION ONE

STUDENT LEARNING GOALS

- Understand the requirements and expectations of the course.
- Recognize the importance of experiencing an inquiry-based, hands-on approach to their own learning.
- Begin to see themselves as part of a community of learners.

Materials List

General
- Computer with internet access/speakers
- PowerPoint slides for Session 1 (downloaded from website)
- Data projector
- Course Reader
- Big Ideas of Early Mathematics textbook
- Optional: copies of California Preschool Foundations in Science and California Preschool Foundations in Mathematics (if not teaching in California, use guidelines from your state)

For the Science Activity
- Paper-copter templates (printable) (1 per student)
- Paper clips (3-5 per student)
- Scissors (1 per pair)

Other Printables and Handouts (customizable)
- Course syllabus
- Course calendar
- List of weekly homework assignments
- Learner profiles
- People Bingo game sheets
### Session at a Glance

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<tr>
<th>Topic</th>
<th>Description</th>
<th>Estimated Time (In Minutes)</th>
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<td>Arrival Activity</td>
<td>Students complete learner profile forms to provide instructor with relevant information about their backgrounds, prior knowledge, and expectations from the course.</td>
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<tr>
<td>Introductions, Attendance, and Course Goals</td>
<td>Instructor introduces him/herself and gives an overview of the course goals and philosophy.</td>
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<tr>
<td>Icebreaker: People Bingo</td>
<td>Students participate in an icebreaker activity to get to know each other in a fun way and to set the tone for an interactive course.</td>
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<tr>
<td>Syllabus and Other Course Essentials</td>
<td>Review course syllabus, calendar, and policies. Introduce course reader, textbook, homework expectations, and online course website.</td>
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<tr>
<td>Science Activity: Paper-Copters</td>
<td>Students participate in a hands-on activity, Paper-copters, to engage them in a playful, open-ended investigation and give them a taste of the participatory hands-on nature of the course.</td>
<td>30</td>
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<tr>
<td>Optional: Video and Discussion</td>
<td>Watch a video to spark conversation about curiosity as the basis of scientific investigation.</td>
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<tr>
<td>Looking Ahead to Next Session</td>
<td>Discuss the homework and reading assignment to be completed before next session. Go over the materials that the students will be responsible for bringing.</td>
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</table>

**Total Estimated Time:** 2 hr 10 min

**Note:** Session 1 is shorter than other sessions since students are typically still “shopping” for courses during the first week of classes.

### Before Session

- Review the materials relevant to this session:
  - PowerPoint for Session 1 (downloaded from website)
  - Reader Section: Session 1
- Make copies of printables and handouts.
- Set up materials:
  - Prepare materials for each group of 4-6 students to make paper-copters. Students will need: paper-copter templates, scissors, and paper clips.
Getting Started

**Arrival Activity:** Have students complete learner profiles. Let students know that you will use them for instructional planning.

1. **Welcome and introduce yourself.**
   - Tell students why you are enthusiastic about the course.
   - Share some information about yourself (educational background, etc.).

2. **Review agenda.**

3. **Take attendance** (you may wish to do this later in class to accommodate late arrivals).

4. **Introduce the course goals.**
Research shows that science and math are areas that tend to be given less attention in preschool and other early childhood programs. A large reason for that is teachers tend to be less prepared and confident in these areas. With this in mind, this course is designed to provide knowledge, experiences, and resources to prepare current and future teachers. Students will learn how to... (slide is animated so bullets appear on click)
   - create an environment in which children are eager to explore and learn about science and math.
   - make science and math part of daily routines, activities and interactions.
   - plan and provide developmentally appropriate early learning experiences in science and math.
   - integrate science and math with each other and with other domains (literacy, dramatic play, art, social/emotional).
   - learn how to use the *California Science and Math Foundations* as a resource.
   - involve families in supporting their child’s growth in science and math.

5. **Introduce the Community of Learners philosophy.**
   - We are a community of learners. We are all learning from each other - students from teacher, teacher from students, and students from students.
   - Everyone’s experiences and ideas are valued. Diversity of backgrounds, perspectives, and experiences help all of us grow.
   - Questions are welcome, expected, and encouraged.
   - Keep an open mind.

6. **Play icebreaker game: People Bingo.**
People Bingo is a great way to have students mingle and get to know each other in a fun, interactive way.

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• Pass out Bingo game sheets and explain directions:
  o Walk around the room and introduce yourself to others.
  o Ask questions from your game board. When you meet someone who fulfills the description in a box, write their name in that box. You can only use each person’s name once.
  o If you get 5 in a row, shout BINGO!
• Begin the game and have everyone get up and begin walking around the room and talking to each other.
• Participate in the game yourself. It will be fun, and seeing you play may encourage students who may be reluctant to play.
• When a person successfully gets 5 in a row and shouts, “BINGO,” pause the game so they can share out what their 5 in a row are. You can continue to play for as long as you want, with more people getting BINGO. You may want to continue playing until someone completes the entire bingo card.
• Following the game: Ask students to share something interesting they discovered about another person or the group. Ask some questions to highlight some characteristics of the group, such as:
  o Were there any boxes that you couldn’t find a match for?
  o Did anyone get a good recommendation for a book or movie?
  o What other languages are represented by people in this class?

7. Review syllabus and other course essentials.
• Pass out and review copies of syllabus, course calendar, and weekly homework assignments.
• Provide information about acquiring the Big Ideas of Early Mathematics textbook, the Course Reader, and the exemplar activity guides. The Course Reader contains resources used in class, so students need to bring it each to each session.
• Explain the type, and expected amount, of homework.
• Introduce students to online course website.
• Answer any questions students may have.

8. Discuss the importance of learning by doing.
• Explain that a key design principle of the course is learning by doing. Just as with children, adults need opportunities to learn by doing, to follow their own curiosity, to explore, experiment, build theories, collaborate with others, and communicate their ideas.
• Highlight the benefits of learning by doing. Teachers need to actively participate in a hands-on, inquiry-based approach to their own learning in order to:
  o feel confident and prepared to present the activities to young children.

Introduce the activity. This is a fun, simple activity for children age 4 and up (older 3-year-olds can participate if copters are pre-made for them). It engages children in creative and innovative thinking while exploring some basic properties of physics and engineering. This activity demonstrates a playful, open-ended approach to science. There's no right way to do it.

Model creating a basic paper-copter.

- Cut the paper-copter template into 4 individual strips by cutting along the thick black lines (with children, a teacher would likely prepare this step for them).
- Using one of the paper-copter strips:
  - Cut along the SOLID LINES wherever the """" appears. (There are 3 lines to cut on: one long vertical, and two short horizontal ones.)
  - Fold along the DOTTED LINES.
    - Make the long folds “C” and “D” to form the base.
    - Fold up the small flap at the bottom of the base.
  - Lastly, fold along line “A” towards you, then fold along line “B” away from you to make the blades.
  - Put a paper clip at the bottom.
- Hold your paper-copter up high and let it go! Launching tip: to get some extra height, try standing safely on a step stool or chair.
- Say something like, “That flew well, but I think I might be able to make it fly even better! What are some ways that I could change my paper-copter to fly better or differently? [Have students think of a few ideas to try--bending the wings, cutting it shorter, adding paper clips, etc.].
- Ask, “What effect do you think these changes would have on how the paper-copter flies?”

Pass out paper-copter templates, scissors, and paperclips. As students are making their paper-copters, circulate from group to group to make sure they understand and are engaged in the task.

Facilitation. Encourage students to test their ideas, improve on them, and try new things. Students are welcome to make more than one paper-copter. Remind them that there is no one right way to do it - everyone’s will be different. If it doesn’t work the first time, what should you do? (Keep trying/try something new).

- Challenges:
  - How can you change your paper-copter to make it fly better or differently?

Instructor Tip: Try this activity yourself first, experiment with different variations of the paper-copter. This will help you when guiding the students through the activity.
o Can you make your paper copter spin faster? Slower?
o Can you make your paper copter spin in the opposite direction?
o Change the length or shape of the blades. What happens?
o How important is the weight at the bottom? Fly your copter without a paper clip. What happens? How does your copter fly if you put two or three (or even four) paper clips at the bottom?

Debrief: Ask questions such as: What did you try? What happened? Have everyone share some of the things they tried. You may want to record a list of modifications they tested (shorter/longer blades, more/less weight, different shaped blades, etc.). Encourage a discussion that includes both things that worked really well and things that did not work so well. What did they do when their ideas didn’t work? Focus on the process of coming up with an idea, creating it, testing it, modifying/redesigning, and testing again. Usually things do not always work exactly the way we want them to the first time. Engineers, scientists, and inventors work hard building, testing, and modifying their ideas. With young children it is important to focus on the process of testing their ideas and learning through trial and error.

http://scienceblogs.com/gregladen/2012/11/20/are-children-natural-scientists-or-not/
  • Click on the hyperlink on the slide to access the video.
  • After watching the video, ask students to share their reactions.

Wrapping Up

10. Looking ahead to next session.
  • Review homework assignment due next session.
    o Have students refer to the “List of Homework Assignments” handout.
    o Explain that the homework assignment requires reading from the California Preschool Learning Foundations. (If not teaching in California, use guidelines from your own state.)
    o These guidelines outline key knowledge and skills that most children can achieve at 36 and 48 months of age.
    o Ask students if they are familiar with these resources and if so, to share their experiences using them.
    o Optional: you may want to show how to go to the url to access the pdf of the Science Foundations and point out sections assigned for homework.
  • Review materials to bring for next session: Explain that student-supplied materials are essential for the hands-on activities in each class.
The hands-on learning at the core of the course depends on the materials provided by students.

- Students need to remember to bring assigned items to each session! Remind them that they receive homework points for bringing their items.
- Refer students to the “Calendar and Items to Bring to Class” handout.
- **Items for next session:** 3 tools or small containers for water play. Course calendar includes suggestions.

11. **Remind students to complete learner profiles and turn them in before leaving.**