

Kindergarten: A Sense of Wonder

Module Overview

The purpose of **A Sense of Wonder** is to encourage students to use inquisitive and persistent behaviors as they wonder about their world. The module extends the strategies introduced in prekindergarten. These strategies include using questions to approach problems and identifying attributes to sort, classify, and make inferences. The attribute strategies serve as the foundation for subsequent Grade One and Grade Two Primary Talent Development (PTD) modules. This module is meant for all students. The classroom teacher should work with a specialist or special educator to find or develop alternate activities or resources for visually impaired students, where appropriate.

Task 1: Focus Lesson 1: Tangram Puzzles

STANDARDS:

- **K.G.A.2.** Correctly name shapes regardless of their orientations or overall size.
- **K.G.B.4.** Analyze and compare two- and three- dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).
- **K.G.B.6.** Compose simple shapes to form larger shapes.
- **1.G.A.2.** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
- **Math Practice 1:** Make meaning of and take risks to persevere through complex mathematical problems utilizing strategic thinking and reasoning.

PURPOSE:

This lesson encourages students to show persistent behaviors by:

- Staying on task for a reasonable period of time.
- Looking for more than one way to accomplish a task.
- Analyzing the situation and continue to search for additional information.
- Analyzing, testing, and verifying their conclusions.

MATERIALS:

- Persistent Poster (RS)
- Model tangram puzzle for use on magnet board or overhead (RS 2)

- Individual student tangram puzzles – one per student (RS 2)
- Blank white paper

ENRICHMENT:

Draw a straight vertical line down a sheet of paper. Have the student create a figure on the left side of the line using one set of tangrams. Give the student an additional set of tangrams with the task of creating a mirror image on the right side of the line.

ENGAGEMENT:

Tell students, “Today we are going to play with puzzles.”

Ask, “What does it take to solve a puzzle?”

Share the Persistent Poster Resource Sheet

1. Show students the Tangram Resource Sheet.
2. Explain that a tangram is an ancient Chinese puzzle with seven shapes called tans, all cut from a single square.

Share the objective that they will use persistent thinking behaviors to solve a tangram puzzle.

EXPLORATION:

Cut the model tangram square apart along the designated lines. Talk about each of the shapes, identifying their attributes and geometric names (triangles, square, and parallelogram). Give each student a set of tangram pieces. Ask questions about how the shapes relate to one another. Possible responses might include, “They all make up part of the big square; the two large triangles are the same size; the two small triangles cover the little square; there is a small, medium, and large triangle just like the story of “The Three Bears.”

EXPLANATION:

Explain that when putting together a regular jigsaw puzzle, the pieces must go together in only one way. Tangram puzzles are different. They can be arranged in many different ways to make figures and shapes. Model how the tangram pieces can be arranged to look like a boat. Rearrange the pieces to create a bridge and create birds or fish, as needed.

EXTENSION:

Pass out blank white paper to use as a background. Encourage students to form various letters of the alphabet with their tangram pieces. This is more difficult than it sounds. Some students may benefit from specific suggestions. Maximize success and self-efficacy by providing appropriate support and honoring students’ motivation.

EVALUATION:

Give each student a new sheet of blank paper. Have them manipulate the seven tangram pieces to create familiar figures. Observe the degree of persistence that students demonstrate during the task. Do they have an idea and stick with it? Do they seem random in their placement and accept ideas as they stumble upon them? Take photographs, sketch completed figures, and scribe comments to document persistent behaviors.

THE FOLLOWING ARE THE FOCUS LESSON 1 TEACHER RESOURCES:

- [RS2 Tangram Puzzle accessible](#)
- [RS1 Persistent Poster accessible](#)

Task 2: Extension Lesson: Tangram Animals

STANDARDS:

- **K.G.A.2.** Correctly name shapes regardless of their orientations or overall size.
- **K.G.B.4.** Analyze and compare two- and three- dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).
- **K.G.B.6.** Compose simple shapes to form larger shapes.
- **1.G.A.2.** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

PURPOSE:

- Assess visual memory
- Assess spatial skills
- Reinforce metacognitive awareness

MATERIALS:

- Student Observation Form (RS1 Tangram Animals)
- Ceramic tile to use in storytelling
- Document Camera
- Tangram set for the teacher to use with document camera (RS2)
- Tangram Template (for use in making tangrams out of tagboard, as needed)
- Set of seven tangram pieces for each student (RS2)
- Tangram Designs for Kindergarten and for Grade 1 (RS2)

- Copy of Tangram Square for each student (RS2)
- Story: Grandfather Tang by Ann Tompert (See Considerations.)

METACOGNITIVE AWARENESS:

Ask students to tell what they remember about the brain, memory, and thinking from previous lessons. Lead them in the “Brain Chant” from Identification Lesson 1. Discuss the difference between brainstorming and problem-solving.

SETTING THE STAGE:

Show students a ceramic tile before telling them the following story:

“This is the legend of Gram, the Chinese tilemaker, who made the most beautiful tile that everyone wanted to buy. However, Gram decided to take it as a gift to Emperor Tan, who lived in the Forbidden City. A great wall and a cobblestone walkway surround the Forbidden City in China. As Tan was walking into the open gates of the Forbidden City to meet Emperor Tan and give him his gift, he slipped and fell on the cobblestone; the tile flew out of his hand and broke into seven pieces. Gram was upset. When he saw Emperor Tan approaching, he was scared for his life because he had destroyed the Emperor’s great gift. The Emperor walked near Gram. At the same time, a child who was trying to help Gram put the pieces of the tile back together shouted out that the pieces looked like a bird. Emperor Tan looked down as the child moved the pieces again, and someone else said the pieces looked like a teapot. This went on for a while until it intrigued the Emperor, who invited Gram into the Forbidden City to move the seven tile pieces around and make different pictures. This became a pastime for the Emperor, who named the new magic puzzle a Tangram after himself and the tilemaker Gram. The seven pieces of the tangram are still a favorite pastime of the Chinese children and other children around the world.”

EXPLORATION WITH MANIPULATIVES:

1. Give each child a set of tangrams.
2. Ask students which different geometrical shapes they see in the set of seven tangram pieces.
3. Provide an exploration time for students to make different designs.
4. Explain that making a picture with the tangrams requires that each piece must touch another piece and that the pieces may not overlap. Model and discuss touching and overlapping pieces.
5. Circulate among the children, asking questions about their new creations and encouraging them to change positions of the tangram pieces.

INDEPENDENT APPLICATIONS:

1. Tell students they are going to see examples of animals they can make with tangrams.

2. Using the examples provided on Tangram Designs, arrange the tangram pieces using the document camera (with the projector light turned on) to form the first design, a fish. By having the document camera light turned on, students can observe the process of arranging the seven tangram pieces into a design.
3. Ask students what they think the design is and to give reasons for their ideas.
4. Ask students to copy the design with their tangram pieces.
5. Repeat the procedure with the second design, the dog.
6. Assemble each of the remaining designs (the rabbit and the rooster) with the projector light turned off. After assembling each design, ask the students to attempt to copy the design and to tell which animal it might be and why.
7. After observing those students who can complete the last two designs, separate the pieces using the document camera slightly to enable all students to complete the designs.
8. Allow time for students to create additional designs with their set of tangrams.
9. As a final activity, distribute the square template to each student. Ask the students to arrange all seven tangram pieces so that they fit perfectly into the shape of a square. Have students put “thumbs up” when they complete the square—document which students complete the square quickly and correctly.

Teacher Observation:

Observe which students can reproduce teacher-modeled designs, create new designs, and arrange the seven tangram pieces in the tangram square quickly and correctly.

Considerations:

- Prepare magnetized tangram pieces for use on the whiteboard as needed.
- Challenge students to create designs that use all seven tangram pieces.
- Read Grandfather Tang’s Story by Ann Tompert for enrichment.
- Create a tangram learning center (Include sets of the tangram pieces, sample designs to create, tangram stories, and other related resources/ activities).

THE FOLLOWING ARE THE TASK TWO: EXTENSION LESSON TEACHER RESOURCES:

- **RS2 Tangram Animals accessible**
- **RS1 Lesson 2 Tangram Animals Observation accessible**

Task 3: Focus Lesson 2: Guest Interview

STANDARDS:

- **SL.K.1.** Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- **SL.K.3.** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

ENGAGEMENT:

Ask, "What is my name?" Have students answer, "Your name is..." Show the closed-hand icon on Open Closed RS 3 and explain that the question was a convergent/closed question because it generated just one answer. Then ask, "What should we name the new puppy?" Have students make an open hand on RS 3 and offer many answers. Explain that this question was divergent/open because it generated many answers. Tell students that when they are curious, they are being inquisitive, which usually leads to asking convergent and divergent questions. Inquisitive behaviors help people learn new things and figure things out in order to solve problems RS 4, Inquisitive poster. As a final check for understanding, offer a mix of questions. Use the every pupil response strategy having students show an open or closed hand to identify the question as convergent/closed or divergent/open.

EXPLORATION:

Option 1- Invite a guest (ex. principal) to the classroom to provide an engaging opportunity for students to exhibit inquisitive behaviors. Introduce the guest and have the students ask questions. Record the questions, followed by students' initials, on chart paper or on the Inquisitive Behavior Recording Sheet RS 5.

Option 2- Use a picture of a celebrity or a favorite book character to provide an engaging opportunity for students to exhibit inquisitive behaviors. Display the picture of the celebrity or have students reflect on their favorite book character. Have the students ask questions. Record the questions, followed by students' initials, on chart paper or on the Inquisitive Behavior Recording Sheet RS 5.

EXPLANATION:

After the guest leaves, review the questions. Discuss which were convergent and which were divergent.

- Review that convergent questions begin with who, what, when, where, why, and how, and usually prompt one answer.
- Review that a divergent/open question generates many answers. Divergent questions often begin with, "What if..."

EXTENSION:

Pair the students. Have them practice generating convergent and divergent questions by interviewing one another.

EVALUATION:

Ample documentation will be gathered during the guest interview. Remember to initial each question so that you can cut the chart apart to include the individual artifact in the student's portfolio.

THE FOLLOWING ARE THE FOCUS LESSON 2 TEACHER RESOURCES:

- [RS3 Open/Closed Hand Images accessible](#)
- [RS4 Inquisitive Poster accessible](#)
- [RS5 Interview Student Response accessible](#)

Task 4: Lesson 1: Twenty Questions

STANDARDS:

- **SL.K.3.** Ask and answer questions to seek help, get information, or clarify something that is not understood.

ENGAGEMENT:

Gather students on the rug. Tell students that they are going to play a game called "Twenty Questions."

EXPLORATION:

Show them a beautifully wrapped "Wonder Box" with a taped, yet removable lid. Ask, "Are you curious about what is inside?" Encourage them to look at the box and think about what might be inside based on essential attributes. Comments might include, "It is no bigger than the box. It must be short. It probably isn't very heavy." Prompt more responses by gently shaking the box. Expanded responses could be, "It's empty." "The item fits tightly inside. "It doesn't make a sound." Prompt once again by asking a student to hold the box with two index fingers. "It's not heavy." or "There are feathers inside," might be final comments.

EXPLANATION:

When we are curious, seeing and observing closely is often enough to satisfy us. However, sometimes observing is not enough and we must be inquisitive and ask questions. The game "Twenty Questions" requires that we only ask convergent questions that can be answered YES/NO. Model the difference between how the question "Is it a matchbox car?" is different from the question, "Is it a toy?" The first question can be answered YES or NO but not encourage us to think or ask more questions. The second question can also be answered YES or NO, but it encourages us to think and ask a more focused follow-up question. When playing "Twenty Questions," start with open/divergent questions ("Is it food?") and move to

more closed/convergent questions (“Do we eat it for lunch? Is it a fruit? Is it red?). Students will likely ask closed/convergent questions that guess at what is in the box (Is it a feather?). Record questions and gently remind them that good questions bring answers and more questions.

EXTENSION:

1. Share the rules of the game:
2. Ask a YES/NO question.
3. Think about the answer
4. What seems to be a good follow-up question?
5. Ask another question that is more focused on what might be in the box in front of them.

Yes	No
Does it fill up the box?	Is it colorful?
Can I play with it?	Is it a toy?
Can I use it with other things?	Is it food?
Does it go inside of other things?	Does it smell?
Is it invisible?	Does it roll?
Does it move?	Can I see it?

Review all YES and NO examples. Open the box. Students will initially exclaim, “It’s empty!” (convergent/remembering). Ask, “Is it empty?” (divergent/analyzing) Lead them to understand that the box is not empty, but contains air. EVALUATION: Build a Wonder Web with the students using chart paper or Kidspiration (if you have the software). Write the word air in the center and web students’ questions around the word. (This could also be done as a Mindmap). If students do not ask, “How can we see air?” add it as the teacher’s question. Explain that they will explore air over the next few days to find answers to some of their questions.

The teacher will create their own wrapped box. There are no additional resources for this lesson.

Task 5: Lesson 2: See, Think, Wonder

STANDARDS:

- **SL.K.3.** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

PROCEDURES:

1. Model the use of the “See/Think/Protocol by selecting a piece of artwork to analyze with students.

2. Select pictures to place around the room as “stations.” Have a piece of chart paper with “See, Think, Wonder” (one column for each) Have small groups of students rotate to each picture station.
Kidwatching: Note how students are grasping the inquiry process.
3. Select a picture for students to analyze independently and complete a “See, Think, Wonder” Resource Page.

THE FOLLOWING ARE THE LESSON 2 TEACHER RESOURCES:

- **Famous Paintings**
- **Arts and Culture Photographs**
- **101 Questions**
- **See, Think, Wonder Worksheet accessible**
- **See, Think, Wonder Resource Page accessible**

Task 6: Bridging Experience

STANDARDS:

- **SL.K.3.** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

PROCEDURES:

1. Go to “What Are You Wondering?” section of the Wonderopolis website (See attached as a resource). Evaluate the questions in terms of divergent/convergent.
2. Go to “Explore Wonders Tab.” Choose a question to explore with students. Read it aloud. This is a great way to build students’ interest in informational texts early in their schooling!
3. Explain how an interesting question can lead to the research process. The teacher is advised to read the attached resource titled “Engage Primary Students in Science.”
4. Have students determine a question and complete a “Find Out About Your World” resource sheet (See attached resource).

THE FOLLOWING ARE THE BRIDGING EXPERIENCE TEACHER RESOURCES:

- [Wonderopolis](#)
- [Article: Engage Primary Students in Science](#)
- [Example A: Find Out About Your World accessible](#)
- [Example B: Find Out About Your World accessible](#)
- [Find Out About Your World Blank Template accessible](#)