**Gina L. Gullo**

**Lesson Plan**

**1.** **Lesson** Making Clouds **Subject** Science **Date**

**2. Target Grade/Age Level:** Grades K-2, Autistic Support

**3. PDE Standards:**

Reading, Writing, Speaking and Listening:

1.6.**K**.B. Speak clearly enough to be understood by all audiences using appropriate volume. Share stories, familiar experiences, and interests, employing gestures where appropriate

1.6.**1**.B. Use appropriate volume and clarity in individual or group situations. Deliver brief oral presentations on a topic supported by visual aids.

1.6.**K**.A. Listen and respond appropriately to others in small and large group situations.

1.6.**1**.A. Listen actively and respond to others in small and large group situations with appropriate questions and ideas.

1.8.**K**.A. Ask appropriate questions on a variety of topics.

1.8.**1**.A. Generate appropriate questions about a topic.

Science:

3.2.**K**.A1. Identify and classify objects by observable properties of matter. Compare different kinds of materials and discuss their uses.

3.2.**1**.A1. Observe and describe the properties of liquids and solids. Investigate what happens when solids are mixed with water and other liquids are mixed with water.

3.2.**1**.A4. Observe and describe what happens when substances are heated or cooled. Distinguish between changes that are reversible (melting, freezing) and not reversible (e.g. baking a cake, burning fuel).

Science as Inquiry:  
• Distinguish between scientific fact and opinion.

• Ask questions about objects, organisms, and events.

• Understand that all scientific investigations involve asking and answering questions and comparing the answer with what is already known.

• Plan and conduct a simple investigation and understand that different questions require different kinds of investigations.

• Use simple equipment (tools and other technologies) to gather data and understand that this allows scientists to collect more information than relying only on their senses to gather information.

• Use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with their current scientific knowledge.

• Communicate procedures and explanations giving priority to evidence and understanding that scientists make their results public, describe their investigations so they can be reproduced, and review and ask questions about the work of other scientists.

Student Interpersonal Skills:

16.2.**K**.A Interact with peers and adults in a socially acceptable manner.

16.2.**K**.C Engage in reciprocal communication with adults and peers.

**PA Common Core Standards:**

CC.1.5.**K**.E Speak audibly and express thoughts, feelings, and ideas clearly.

CC.1.5.**1.**E Produce complete sentences when appropriate to task and situation.

CC.1.5.**K-1**.G Demonstrate command of the conventions of standard English when speaking, based on kindergarten/Grade 1 level and content.

*Note: Grade levels for all standards are bolded.*

**4. Learning Objectives and Aligned Summative Assessments:**

*Note: The overall objective is the aim of this lesson; however, individual IEP objectives are included in this lesson as they can be worked on in ways that complement the content of this lesson.*

| **Overall Learning Objective** | **Aligned Summative Assessments** |
| --- | --- |
| Given a one-on-one question, the student will respond to the question, “Do clouds have water in them?” (yes) with 100% accuracy. | Summative interview |

| **IEP Based Learning Objectives by Student** | **Aligned Summative Assessments** |
| --- | --- |
| Pink:  During small or large group instruction, Pink will sit appropriately (keeping hands to herself, waiting to be called on before speaking, sitting up straight, etc.) for at least 10 minutes for 5/5n opportunities presented.  During instructional time (i.e. work centers, deskwork, etc.), Pink will increase appropriate behaviors (task completion without incident) by reducing escape related behaviors in the form of saying, “I can’t do it,” flipping through her materials, staring at the instructor to direct attention away from the task, etc. from a current rate of approximately 6 per week to 1 or less per week. | Weekly Probes  Weekly Probes  Weekly Probes |
| Red:  During small group instruction and when no prompt is given, Red will remain seated with a quiet voice for 15 minutes for 4/5 weekly opportunities over 3 consecutive probes.  During work stations/centers, Red will remain engaged in the task for at least 5 minutes before taking a break for at least 8/10 weekly opportunities over 3 consecutive weekly probes.  Throughout the school day, and when an item/ activity is or is not present, Red will accurately request and item/activity (e.g. say, “skittle” instead of “green”) using a phrase consisting of 2 or more words for at least 10 different items/activities throughout the school week over 3 consecutive weekly probes. |
| Green:  During group instruction in either the regular education or special education classroom, Green will remain on topic while contributing to the discussion (e.g. he will not bring up his dog while the group is discussing the weather, etc.) for 10/10 opportunities presented over 3 consecutive weekly probes.  When asked about a past event, Green will accurately report about it by stating 3 (or more) details including when it occurred, for at least 4/5 past events over 3 consecutive weekly probes. |
| Blue:  Throughout the day, when a peer asks Blue a question, Blue will answer their question within 5 seconds for 9/10 opportunities present over 3 consecutive weekly probes.  Throughout the school day (task demand, transitions, preferred activities, etc.), Blue will continue to improve appropriate behaviors (i.e. squeezing head or hands) by decreasing the number of times he hits the sides of his head/bangs his head, from a current rate of 230 per week to 5 or less per week over 5 consecutive weekly probes.  During group instruction (e.g. Morning Opening/Circle), Blue will independently ask for a break or remove himself from the group quietly and calm down for 90% of opportunities present throughout the school week over 3 consecutive weekly probes. |
| Navy:  When an adult places an object in a targeted position in relation to a second object, Navy will independently label the targeted position (in, on, under, etc.) with 100% accuracy for 8 targeted prepositions over 3 consecutive weekly probes. (targeted prepositions: in, out, on, over, under, behind, beside, in front)  Given instruction within a small or large group setting, a visual picture cue, and an adult model, without verbal direction, Navy will follow the visual cues provided in order to modify his “listening manners” behavior by sitting appropriately on his chair, with quiet lips, quiet hands, quiet feet, eyes on speaker, and listening/following directions for 80% of opportunities presented over 3 consecutive weekly probes.  When participating in a group activity, or after he has completed an independent activity, and Navy wants to gain the attention of an adults, Navy will independently raise his hand to gain attention from an adult while remaining quiet (no talking or noises) for 80% of opportunities presented, over 3 consecutive weekly probes. |
| Purple:  Given instruction within a small or large group setting, a visual picture cue, and an adult model, without verbal direction, Purple will follow the visual cues provided in order to modify his “listening manners” behavior by sitting appropriately on his chair, with quiet lips, quiet hands, quiet feet, eyes on speaker, and listening/following directions for 80% of opportunities presented over 3 consecutive weekly probes.  When participating in a group activity, or after he has completed an independent activity, and Purple wants to gain the attention of an adult, Purple will independently raise his hand to gain attention from an adult while remaining quiet (no talking or noises) for 80% of opportunities presented, over 3 consecutive weekly probes.  When an adult places an object in a targeted position in relation to a second object, Purple will independently label the targeted position (in, on, under, etc.) with 100% accuracy for 8 targeted prepositions over 3 consecutive weekly probes. (targeted prepositions: in, out, on, over, under, behind next to/beside, in front) |
| Black:  During naturally occurring situations throughout the day and in the event that a peer is engaging in a behavior that Black does not approve of, Black will focus on his own appropriate behaviors and the appropriate behaviors of his other peers by remaining quiet and engaged in the instruction/activity for 9/10 weekly opportunities.  During instructional and non-instructional time, when Black is required to sit and/or wait quietly (i.e. morning opening, deskwork, centers, transitions, etc.), Black will sit quietly without making loud noises/calling out for 15 minutes or 9/10 weekly opportunities.  During instructional time, Black will raise his hand and wait to be called on before answering a question for 9/10 weekly opportunities.  During group instruction and in the event that Black raises his hand to answer a question and another peer is called on, Black will accept this by sitting quietly and waiting for his turn to be called on for 9/10 weekly opportunities.  Throughout the day, during instructional/non-instructional time, when Black wants to gain the attention of an instructor, he will raise his hand quietly and wait to be called on for 9/10 weekly opportunities. |
| Yellow:  Throughout the day, Yellow will request items/activities she wants using a 2-word phrase (e.g. green skittle, doll please) for at least 10/10 items/activities.  When presented with an item that Yellow may or may not want, Yellow will say, “Yes” or “No” to accept or refuse the item for 10/10 opportunities presented.  During instructional time and when verbally given a 2-step direction (i.e. “walk t the door, knock 3 times”) , Yellow will follow the 2-step direction in the order it was given for 90% of all 2-step directions presented.  Throughout the entire day and when given a verbal direction and a visual prompt (e.g. picture, gesture) to transition, perform a task, etc. Yellow will follow each direction within 10 seconds with 100% accuracy of all directions given. |

**5. Materials Needed:**

* One cloud set for every 2 children:
  + 1 ice cube, 1 jar with lid, about 1 oz boiling or very hot water.

**6. Expectations for Behavior and Class Activities:**

* The child will follow teacher directions.
* The child will actively engage in all activities to her best ability.
* The child will treat others respectfully and courteously.
* The child will keep hands and feet to himself.
* The child will remain quiet and seated during the lesson.
* First and second grade student will use a quiet, raised hand to be called on during lesson.

**7. General or Specific Accommodations for Special Needs Learners:**

* + This is a classroom for students with autism, so many accommodations are already in place. Specific accommodations are in each child’s IEP; general accommodations include:
    - Frequent reinforcement using verbal praise or edible rewards.
    - Very low student-teacher ratio, with 2 paraprofessionals and 1 main teacher at the minimum for 8 students.
    - Separation by at least 2 peers for students who are learning to interact with each other.
    - Seating that allows all students in close proximity of the instructing teacher.
    - Differentiated objectives to allow for individualized goal acquisition.

**8. Description of Learning Activities**

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| **Lesson Implementation** |
| Introductory Activity:  The teacher should review yesterday’s evaporation activity. Then she should talk about recent fog and cloudy days. Finally, students should be introduced to the concept of clouds and told they will watch a cloud be made and disappear today.  Modeling/Demonstration:  The teacher should explain that today the students will make their own clouds. Break students into pairs and demonstrate how the experiment will work (if there are fewer students, they may work independently). Tell the students that the teacher will put a little bit of hot water in a jar for them and then spray some hair spray inside. Then, they will get to put an ice cube on top of the jar. Let students know that they will get to make a cloud twice, so each student will have a turn to put the ice cube on top. Model getting a jar (just pretending it was handed over from the teacher with the water and hairspray inside) and then placing an ice cube on top without touching the jar. (Note: the jars will not actually be hot enough to burn students, but they should not be touched because they are warm and glass). Then explain that the first time through the experiment they will just watch it, and the second time, they will talk about what is happening.  Guided Practice and Feedback:  Pour about 1 ounce of hot water into the bottom of a jar and put in a quick (1/2 second) spray of any aerosol product (hairspray works well). Cap the jar and give it to the students on the table. Also hand them an ice cube to place on top.  Independent Practice/Exploring:  Allow the students to watch the cloud form and dissipate. The students will likely be very excited about the cloud. Just make sure they are careful with the jar and allow them to enjoy the experience. Now, repeat the experiment for each set of students by pouring out the leftover liquid and starting again. Let the second student place the ice cube on top of the jar this time (Note: Navy and purple have prepositional goals, so at some point ask them where the ice cube is looking for the term ‘on’). While the cloud is forming and un-forming explain the experiment to the students.  Teacher: A cloud is made by a change in the air like hot and cold air mixing with dust. We used hairspray to put tiny pieces of dust in the air in the jar. We made the jar hot with the hot water and cold by putting the ice cube on top. When we did this a cloud formed. Eventually all the air in the jar became the same temperature, so the cloud “rained” and returned to just being dirty water. This takes a lot longer outside because the ‘jar’ is much bigger. It’s almost the entire world.  Formative Assessment:  Talk to the students while and after they have observed the clouds. See what they think and saw to help assess how well they understood the activity.  Accommodations:  Student who are younger may be paired with older students to help them more fully participate in this experiment.  Review and Preview:  Ask the students what they think would happen if the cold air was much colder and the hot air was less hot. Explain that would make snow. Go on to explain that we only get snow in the winter because the air on the ground and in the sky need to be much colder to make snow. Finally close the activity by linking it to the outside water cycle. Have students talk about where the water comes from to make the clouds and what it looks like when the clouds go away (rain or snow). Have the student look out the window for clouds to guess if it will rain/snow soon or not. Ask why to complete the review noting that clouds are made by water and dust in the air and become rain or snow when the temperature is more even. (Note: there is also a lot of pressure based reasons why it rains or snows, but this will not yet be explained due to the developmental level of the students). |

**9. Potential Areas of Difficulty with the Content and Correction Procedures:**

This experiment may be over the developmental age of some students. These students should be allowed to participate in the experiment for the fun of being a part of an experiment. If they are very lost, an adapted activity may be used as described below.

Turn the humidifier from yesterday on. Put some chalk dust in a ziplock bag and place it over the humidifier. This should make something like a cloud form in the back for a short amount of time.

Some students are working on IEP objectives related to speech that do not necessary mirror the format of this lesson. In order to help them develop those academic skills in a multi-curricular setting inductive of generalization, targeting of objectives may be modified to include these goals.

**10. Summative Assessments:**

At the end of this unit, students will participate in a one-on-one student teacher interview. For this lesson, the following question will be included:

Can you keep a snowball in your pocket overnight? Answer: no

Students in this class are frequently being probed for all of their IEP objectives. They are assessed for each weekly. Below are sample weekly data collections for the IEP objectives included in this lesson for each student.

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| --- |
| Pink**:**  During small or large group instruction, Pink will sit appropriately (keeping hands to herself, waiting to be called on before speaking, sitting up straight, etc.) for at least 10 minutes for 5/5n opportunities presented.   1. + - \_\_\_\_\_/10 min 2. + - \_\_\_\_\_/10 min 3. + - \_\_\_\_\_/10 min 4. + - \_\_\_\_\_/10 min 5. + - \_\_\_\_\_/10 min \_\_\_\_\_%   During instructional time (i.e. work centers, deskwork, etc.), Pink will increase appropriate behaviors (task completion without incident) by reducing escape related behaviors in the form of saying, “I can’t do it,” flipping through her materials, staring at the instructor to direct attention away from the task, etc. from a current rate of approximately 6 per week to 1 or less per week.  Weekly Total = \_\_\_\_\_\_\_\_\_\_\_\_ |
| Red:  During small group instruction and when no prompt is given, Red will remain seated with a quiet voice for 15 minutes for 4/5 weekly opportunities over 3 consecutive probes.   1. + - \_\_\_\_\_/15 min 2. + - \_\_\_\_\_/15 min 3. + - \_\_\_\_\_/15 min 4. + - \_\_\_\_\_/15 min 5. + - \_\_\_\_\_/15 min \_\_/5 = \_\_\_\_\_%   During work stations/centers, Red will remain engaged in the task for at least 5 minutes before taking a break for at least 8/10 weekly opportunities over 3 consecutive weekly probes.   1. + - \_\_\_\_\_/5 min 2. + - \_\_\_\_\_/5 min 3. + - \_\_\_\_\_/5 min 4. + - \_\_\_\_\_/5 min 5. + - \_\_\_\_\_/5 min \_\_/5 = \_\_\_\_\_%   Throughout the school day, and when an item/ activity is or is not present, Red will accurately request and item/activity (e.g. say, “skittle” instead of “green”) using a phrase consisting of 2 or more words for at least 10 different items/activities throughout the school week over 3 consecutive weekly probes.   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - 10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + - \_\_\_\_\_% |
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| Blue:  Throughout the day, when a peer asks Blue a question, Blue will answer their question within 5 seconds for 9/10 opportunities present over 3 consecutive weekly probes.   1. \_\_\_\_ sec + - 6. \_\_\_\_ sec + - 2. \_\_\_\_ sec + - 7. \_\_\_\_ sec + - 3. \_\_\_\_ sec + - 8. \_\_\_\_ sec + - 4. \_\_\_\_ sec + - 9. \_\_\_\_ sec + - 5. \_\_\_\_ sec + - 10. \_\_\_\_ sec + - \_\_\_\_\_%   Throughout the school day (task demand, transitions, preferred activities, etc.), Blue will continue to improve appropriate behaviors (i.e. squeezing head or hands) by decreasing the number of times he hits the sides of his head/bangs his head, from a current rate of 230 per week to 5 or less per week over 5 consecutive weekly probes. \_\_\_\_\_/week  During group instruction (e.g. Morning Opening/Circle), Blue will independently ask for a break or remove himself from the group quietly and calm down for 90% of opportunities present throughout the school week over 3 consecutive weekly probes.  1 2 3 4 5 6 7 8 9 10 + - \_\_\_\_\_%  Note: Probes taken from first 10 opportunities presented. |
| Navy:  When an adult places an object in a targeted position in relation to a second object, Navy will independently label the targeted position (in, on, under, etc.) with 100% accuracy for 8 targeted prepositions over 3 consecutive weekly probes. (targeted prepositions: in, out, on, over, under, behind next to/beside, in front)  1. in + - 5. under + -  2. out + - 6. behind + -  3. on + - 7. next to/beside + -  4. over + - 8. in front + - \_\_\_\_\_\_%  Given instruction within a small or large group setting, a visual picture cue, and an adult model, without verbal direction, Navy will follow the visual cues provided in order to modify his “listening manners” behavior by sitting appropriately on his chair, with quiet lips, quiet hands, quiet feet, eyes on speaker, and listening/following directions for 80% of opportunities presented over 3 consecutive weekly probes.  1. + - 6. + -  2. + - 7. + -  3. + - 8. + -  4. + - 9. + -  5. + - 10. + - \_\_\_\_\_\_%  When participating in a group activity, or after he has completed an independent activity, and Navy wants to gain the attention of an adult, Navy will independently raise his hand to gain attention from an adult while remaining quiet (no talking or noises) for 80% of opportunities presented, over 3 consecutive weekly probes.  1. + - 6. + -  2. + - 7. + -  3. + - 8. + -  4. + - 9. + -  5. + - 10. + - \_\_\_\_\_\_% |
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| Yellow:  Throughout the day, Yellow will request items/activities she wants using a 2-word phrase (e.g. green skittle, doll please) for at least 10/10 items/activities.  1. + - 6. + -  2. + - 7. + -  3. + - 8. + -  4. + - 9. + -  5. + - 10. + - \_\_\_\_\_\_%  When presented with an item that Yellow may or may not want, Yellow will say, “Yes” or “No” to accept or refuse the item for 10/10 opportunities presented.  1. + - 6. + -  2. + - 7. + -  3. + - 8. + -  4. + - 9. + -  5. + - 10. + - \_\_\_\_\_\_%  During instructional time and when verbally given a 2-step direction (i.e. “walk t the door, knock 3 times”) , Yellow will follow the 2-step direction in the order it was given for 90% of all 2-step directions presented.  1. + - 6. + -  2. + - 7. + -  3. + - 8. + -  4. + - 9. + -  5. + - 10. + - \_\_\_\_\_\_%  Throughout the entire day and when given a verbal direction and a visual prompt (e.g. picture, gesture) to transition, perform a task, etc. Yellow will follow each direction within 10 seconds with 100% accuracy of all directions given.  1. + - 6. + -  2. + - 7. + -  3. + - 8. + -  4. + - 9. + -  5. + - 10. + - \_\_\_\_\_\_% |

**11. Reflections**: This lesson went close to perfectly. I was very happy with everything. I planned and tested quite a lot in advanced and it truly paid off.

**12. Sources:**

Kidspot. (2013). Make your own cloud. Retrieved on 2014, Feb 5 from http://www.kidspot.com. au/kids-activities-and-games/science-experiments+10/how-to-make-a-cloud-in-a-jar+12511.htm