KINDERGARTEN ART & SCIENCE

INQUIRY ACTIVITY

3 TYPES OF INQUIRY (Teachers will work to guide students from structured to open inquiry, scaffolding student learning.)

Structured Inquiry - Students are given the question or problem, the method and materials to solve the problem.

Guided Inquiry - Students are given the question or problem, but they determine the method and materials needed to solve the problem.

Open Inquiry - Students determine the problem, the methods and the materials necessary.

BIG IDEAS

I can use the inquiry process to explore new things.

I can mix things together to create new and unique materials.

OVERALL CURRICULUM EXPECTATIONS

OE1. Communicate with others in a variety of ways, for a variety of purposes, and in a variety of contexts;

OE 2. Demonstrate independence, self-regulation, and a willingness to take responsibility in learning and other endeavours;

OE 4. Demonstrate an ability to use problem solving skills in a variety of contexts;

OE 13. Use the processes and skills of an inquiry stance (i.e., questioning, planning, predicting, observing, and communicating;

OE 14. Demonstrate an awareness of the natural and built environment through hands-on investigations, observations, questions, and representations of their findings;

OE 23. Use problem-solving strategies, on their own and with others, when experimenting with the skills, materials, processes, and techniques used in drama, dance, music, and visual arts;

OE 24. use technological problem-solving skills, on their own and with others, in the process of creating and designing (i.e., questioning, planning, constructing, analysing, redesigning, and communicating);

MATERIALS

Paper, paint brushes, paint, water, mixing trays, mixing tools, salt, shaving cream, glue, flour, oil, etc.

HOOK

1. Have a variety of materials on the back table when students come in from recess. They will naturally be curious about these materials. Encourage this natural curiosity by allowing students to peruse these items.
2. Tell students that today we're going to be exploring different materials in art class. Pick up a paint brush and paint a red line on the piece of paper, being sure to keep some red paint on the brush.
3. Pick up lots of blue paint on the paint brush and apply a blue line to the piece of paper. When the blue paint begins to mix with the red, stop and look at the paint with wonder.
4. Allow a few seconds before proceeding in order to provide students time to soak in the wonder of what is happening. "Wow! What happened to my paint?!?!"

INQUIRY ACTIVITY

1. QUESTIONING - Whole Class Discussion - What do you think just happened? Develop a hypothesis and guiding question. *(e.g. Does mixing paint create new colours?)*

2. PLANNING & PREDICTING - Pair & Share - How could we find the answer to this question? What materials do we need? What do you think will happen? Could you record this in your science journal? (Use pictures or words to record.)

   Allow students to use whatever materials they need for their inquiry. Work with students to guide their inquiry process allowing them to make mistakes since this is how they learn and is part of the inquiry process. When students are stuck use guiding questions to help re-direct them, but don't provide the answers.

   Assessment As Learning - How will you know that you are successful? (Develop assessment criteria with students. E.g., "I can come up with a plan to test my question. I will know that I am successful when I have an answer to my question.)

3. OBSERVING - Students will follow through with their plan to test their hypothesis and answer their guiding question(s). Students will observe and record their findings in their science journals.

   Assessment As Learning - Talk with students individually as they work. Use guiding questions as necessary to help them self-assess. Did they achieve the success criteria?

4. COMMUNICATING - Whole Class Discussion - Each pair will take the time to share their line of inquiry and results. Allow students to question and suggest different methods and materials. If things didn't work, allow students to discuss why they arrived at the results that they did.

Assessment As Learning - As students share with the class, guide and encourage them to discuss things that worked and things that didn't and reflect on their learning.

5. EXTENDING LEARNING THROUGH OPEN INQUIRY* - Suggested teacher talk: "Class, we asked and answered the question, "What happens when we mix paint colours?. What else could we learn from the materials on the back table?" "Do you have any questions that you'd like to ask?" "Is there something that you'd like to try out or play with?" Gently guide students through the inquiry process once more: questioning, planning, predicting, observing & communicating.. During this process students will be participating in Open Inquiry. They determine the question the materials and the process that they wish to use.

   Assessment As Learning -
   **Now that students have worked through the inquiry process in a guided inquiry format, provide students with the opportunity to openly explore in an Open Inquiry where they ask the question and decide what process and materials to use.*

6. Whole Group Sharing Learning, Successes & Challenges

   Assessment As Learning - Provide students with the opportunity to reflect on their learning. What worked, and what didn't work? What would you change next time? Are there any next steps that we should take?

ASSESSMENT

1. Assessment As Learning: "Teachers engage in assessment as learning by helping all students develop their capacity to be independent, autonomous learners who are able to set individual goals, monitor their own progress, determine next steps, and reflect on their thinking and learning." (Growing Success. 2010. p. 28) The Kindergarten Addendum (2018) defines assessment of learning as "provid[ing] feedback and apply[ing] strategies that support children in assessing their own learning, and so engage them in the learning process." (p. 5)
2. Assessment for Learning will be on ongoing throughout the entire lesson as teachers guide students in their line of inquiry. (See italicized assessment opportunities outlined in the lesson.)

RESOURCES CONSULTED

Florida Museum. *Wings Scientific Inquiry.* Retrieved from https://www.floridamuseum.ufl.edu/wings/Doc/WINGS_scientific_inquiry.pdf on 26 July 2019.

Learn Alberta. (2006.) *Instructional Strategies: Inquiry Based Learning*. Retrieved from http://www.learnalberta.ca/content/kes/pdf/or_ws_tea_inst_02_inqbased.pdf on 26 July 2019.

Ontario Ministry of Education (2010). *Growing Success*. Retrieved from http://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf on 29 July 2019.

Ontario Ministry of Education. (2018). *Growing Success - The Kindergarten Addendum.* Retrieved from http://www.edu.gov.on.ca/eng/policyfunding/GSKindergartenAddendum2018.pdf on 29 July 2019.

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