

The background features a light purple-to-blue gradient. Numerous realistic water droplets of various sizes are scattered across the frame, some with highlights and shadows. In the center, there is a faint, light-colored circular graphic that resembles a stylized sun or a lens flare.

SCIENCE IS EVERYWHERE! LEARNING WITH INFANTS & TODDLERS

MAEGAN HEIMES

WHO ARE WE?

- INTRODUCTION
- TIME IN FIELD
- WORK IN FIELD



- WHAT DO YOU THINK OF WHEN YOU HEAR THE WORD SCIENCE?

- WHAT DO YOU THINK OF WHEN YOU HEAR SCIENCE RELATED TO INFANTS AND TODDLERS?



SCIENCE FRAMEWORK – THREE PARTS

PRACTICES:

SCIENTIFIC PRACTICES ARE THE BEHAVIORS THAT SCIENTISTS ENGAGE IN TO EXPLORE AND DEVELOP KNOWLEDGE.

CROSSCUTTING CONCEPTS:

CROSSCUTTING CONCEPTS ARE BIG IDEAS THAT HELP SCIENTISTS CONNECT KNOWLEDGE FROM VARIOUS EXPERIENCES TO DRAW CONCLUSIONS AND CREATE A COHERENT VIEW OF THE WORLD.

CORE IDEAS:

DISCIPLINARY CORE IDEAS ARE THE CONTENT THAT PROVIDE A CONTEXT FOR ENGAGING IN PRACTICES AND DEVELOPING AN UNDERSTANDING OF CROSSCUTTING CONCEPTS.

PRACTICES

- MAKING OBSERVATIONS:

HOW CHILDREN USE THEIR SENSES AND TOOLS FOR OBSERVATION TO COLLECT INFORMATION ABOUT THEIR WORLD (E.G. USING THEIR HANDS TO FEEL IF A ROCK IS SMOOTH/ROUGH, EXAMINING A CATERPILLAR WITH A MAGNIFYING GLASS).

- ASKING QUESTIONS & DEFINING PROBLEMS:

HOW CHILDREN DISPLAY INTEREST AND CURIOSITY, DEMONSTRATE WHAT THEY KNOW AND WHAT THEY DON'T (E.G. "WHAT'S INSIDE A BALL?"), AND IDENTIFY SOMETHING THAT NEEDS A SOLUTION (E.G. THE JUICE SPILLED ON THE FLOOR AND WE NEED TO CLEAN IT UP).

- MAKING PREDICTIONS:

HOW CHILDREN USE KNOWLEDGE FROM OBSERVATIONS AND PRIOR EXPERIENCES TO MAKE AN INFORMED HYPOTHESIS (E.G. THIS ROCK IS HEAVY. I THINK IT WILL SINK IN THE WATER).

PRACTICES, CONTINUED...

- DEVELOPING AND USING MODELS:

HOW CHILDREN MENTALLY AND PHYSICALLY REPRESENT REAL WORLD PHENOMENA TO DEVELOP AND DEEPEN THEIR UNDERSTANDING (E.G. DRAWING A HOUSE AND BUILDING IT IN THE BLOCK CENTER).

- PLANNING AND CARRYING OUT INVESTIGATIONS:

HOW CHILDREN ORGANIZE AND IMPLEMENT A PROCEDURE TO TEST A HYPOTHESIS (E.G. ROLLING MARBLES DOWN RAMPS OF VARYING INCLINES TO SEE WHICH ONE GOES FASTER).

- USING MATH AND COMPUTATIONAL THINKING:

HOW CHILDREN USE MATHEMATICS TO QUANTIFY AND DESCRIBE THEIR WORLD (E.G. MEASURING THE HEIGHT OF TWO PLANTS AND DECIDING WHICH ONE IS TALLER).

PRACTICES, CONTINUED...

- DOCUMENTING, ANALYZING AND INTERPRETING DATA:
HOW CHILDREN RECORD, ORGANIZE, AND MAKE SENSE OF DATA (E.G. DRAWING PICTURES TO SHOW HOW OBJECTS “SINK” OR “FLOAT” DURING EXPERIMENT).
- CONSTRUCTING EXPLANATIONS AND DESIGNING SOLUTIONS:
HOW CHILDREN INTERPRET DATA TO GENERATE EVIDENCE-BASED ANSWERS TO THEIR QUESTIONS AND DESIGN SOLUTIONS TO THE PROBLEM (E.G. “I KNOW SPIDERS ARE ALIVE BECAUSE THEY CRAWL”).
- COMMUNICATING INFORMATION:
HOW CHILDREN DOCUMENT AND SHARE THEIR EXPLANATIONS AND CONCLUSIONS (E.G. DRAWING AND HAVING TEACHERS WRITE THEIR DICTATIONS ABOUT WHAT THEY SAW ON A NATURE WALK).

CROSSCUTTING CONCEPTS

- PATTERNS

- THE IDEA THAT EVENTS, PROCESSES AND STRUCTURES REPEAT (E.G. THE SUN RISES IN THE MORNING AND SETS AT NIGHT EACH DAY).

- CAUSE & EFFECT

- THE IDEA THAT A CHANGE IN ONE EVENT, PROCESS, OR STRUCTURE IS THE RESULT OF SOMETHING ELSE (E.G. THE FORCE OF ROLLING BALL KNOCKS OVER A BLOCK).

- SCALE, PROPORTION, AND QUANTITY

- THE IDEA THAT THINGS DIFFER IN SIZE AND QUANTITY, WHICH CAN BE USED TO HELP IDENTIFY PATTERNS AND DRAW CONCLUSIONS (E.G. POOLS AND OCEANS BOTH HAVE WATER, BUT THERE IS MORE WATER IN THE OCEAN, THAN THERE IS IN A POOL).

CROSSCUTTING CONCEPTS

- SYSTEM AND SYSTEM MODELS

- THE IDEA THAT ALL THINGS EXIST AND INTERACT IN ORGANIZED SYSTEMS (E.G. THE GEARS AND PARTS OF A WIND-UP TOY EXIST WITHIN A SYSTEM AND INTERACTS TO MAKE IT FUNCTION).

- STRUCTURE AND FUNCTION

- THE IDEA THAT THE WAY THINGS ARE BUILT AND/OR ORGANIZED DETERMINES WHAT THEY DO AND HOW THEY DO IT (E.G. ROUND THINGS ROLL).

- STABILITY AND CHANGE

- THE IDEA THAT SOME THINGS CHANGE AND SOME THINGS STAY THE SAME (E.G. LIVING THINGS GROW AND NON-LIVING THINGS DO NOT).

CORE IDEAS

- PHYSICAL SCIENCE

MATTER AND INTERACTION

MOTION AND STABILITY

ENERGY

LIGHT AND SOUND WAVES AND THEIR APPLICATION

- LIFE SCIENCE

FROM MOLECULES TO ORGANISMS

ECOSYSTEMS

HEREDITY AND TRAITS

BIOLOGICAL EVOLUTION

CORE IDEAS

- EARTH AND SPACE SCIENCE

EARTH'S PLACE IN THE UNIVERSE

EARTH'S SYSTEMS

EARTH AND HUMAN ACTIVITY

- ENGINEERING, TECHNOLOGY AND THE APPLICATION OF SCIENCE

ENGINEERING DESIGN

LINKS AMONG ENGINEERING, TECHNOLOGY, SCIENCE AND SOCIETY

WHAT DOES SCIENCE LOOK LIKE WITH INFANTS/TODDLERS?

- [HTTPS://WWW.ZEROTOTHREE.ORG/RESOURCES/1573-EVERYDAY-FUN-WITH-SCIENCE-LET-S-TALK-ABOUT-STEM-VIDEO](https://www.zerotothree.org/resources/1573-everyday-fun-with-science-let-s-talk-about-stem-video)

• **COMPLETE LOOKING FOR LEARNING FORMS**

TIME TO PLAY...

- 5 TABLES/GROUPS
 - SOUND
 - SENSORY BOTTLES
 - NATURE/FALL
 - CONTAINERS
 - BLOCKS

AT EACH TABLE...

- LOOK AT THE MATERIALS AND FIRST IDENTIFY WHAT PRACTICES YOU MIGHT SUPPORT THE CHILDREN TO USE WHILE EXPLORING THE MATERIALS
- NEXT, CONSIDER WHAT CROSS-CUTTING CONCEPTS MIGHT BE SUPPORTED BY THE MATERIALS
- NEXT, IDENTIFY WHAT CORE IDEAS MAY BE ADDRESSED BY USING THE MATERIALS
- LASTLY, CONSIDER WHAT QUESTIONS (SEE RIGHT QUESTIONS HAND-OUT) COULD BE USED TO SUPPORT/EXTEND LEARNING

WRAPPING-UP

- **ONE TAKE-AWAY**
- **RESOURCES**
- **RAFFLE**