

*FUNDING FOR THIS PROGRAM
IS PROVIDED BY...*

OKAY, CRAIG, WOULD YOU
LIKE TO COME DO THIS?

YOU'RE TO PUT
MY SAFETY MIT ON HERE.

Jean: I GRADUATED FROM COLLEGE
AND I TAUGHT FOR A FEW YEARS

AND I HAD CHILDREN
AND I STAYED HOME

AND I WAS A FULL-TIME MOTHER,

MAXI-VOLUNTEER
FOR EVERYTHING AND ANYTHING.

THEN I WENT BACK TO TEACHING,

AND I WAS VERY BUSY
WITH MY CHILDREN GROWING UP.

I GUESS ONCE MY DAUGHTER --

SHE WAS IN COLLEGE
WHEN I GOT MY MASTER'S DEGREE --

AND THAT WAS SORT OF THE OPENING
OF A LOT OF DOORS FOR ME,

AS FAR AS MY THINKING WENT.

SO THIS IS --
IT'S A FUN TIME OF MY LIFE.

IT REALLY IS.

NO, NO.

THIS IS ABOVE ZERO,
SO IT'S...ABOUT WHAT?

I SAY "16."

"16." OKAY.

I WAS NOT A SCIENCE MAJOR.

LIKE MOST
ELEMENTARY SCHOOLTEACHERS,

I'M A GENERALIST.

I STARTED OUT AS A HISTORY MAJOR
IN COLLEGE

AND THEN SWITCHED
TO ELEMENTARY EDUCATION.

AND I AVOIDED SCIENCE COURSES
IN COLLEGE AS MUCH AS I COULD.

SO WHENEVER I'M GIVEN

A NEW SCIENCE TOPIC TO TEACH
THAT I HAVEN'T TAUGHT BEFORE,

I HAVE TO GO HOTFOOTING IT
TO THE LIBRARY,
AND I GET EVERY CHILD'S BOOK I
CAN ON THE SUBJECT AND READ IT.

AND SO IT DEVELOPS THAT WAY,
BUT THE FORMAL TRAINING
IS NOT THERE.

IT'S ON THE "2."

STILL?

IT LOOKS LIKE...

Jean: I'M MORE WILLING
TO TAKE RISKS NOW

THAN I WOULD HAVE BEEN
10 YEARS AGO EVEN, IN SCIENCE...

YOU'RE RIGHT.
YOU'RE RIGHT.

Jean: BECAUSE IT'S BETTER
TO TAKE A CHANCE

AND TEACH SOMETHING
YOU'RE NOT TOTALLY SURE OF

THAN IT IS TO SKIP IT
ALTOGETHER,

WHICH I HAVE SEEN HAPPEN HERE
AND OTHER PLACES AS WELL.

THE TEACHERS JUST AVOID --

OR THEY SAY, "YES, I DID IT.
I OPENED THE BOOK.

"THE KIDS SPENT TWO DAYS DOING
WHATEVER IT IS.

THAT'S IT. GOODBYE."

AND I UNDERSTAND THAT.

I THINK IT COMES FROM FEAR
AND FROM LACK OF BACKGROUND.

THE DAY BEFORE YESTERDAY,
WHEN WE BOILED THE WATER,

WE HAD ICE AND THEN WE
PUT IT ON THE HOT PLATE

AND FINALLY
THE HOT PLATE WORKED.

AND WHAT HAPPENED TO THE ICE?

SHELBY?

IT MELTED.

IT MELTED.

AND WHAT HAPPENED
AFTER THE WATER MELTED?

IT GOT ABSORBED
INTO THE AIR,

AND IT TURNED TO STEAM.

OKAY. IT TURNED TO STEAM.

WHAT WAS THE WATER DOING
WHEN IT TURNED TO STEAM?

JONATHAN?

IT WAS EVAPORATING.

BUT WHAT DO WE CALL IT

IF YOUR MOTHER
PUTS SOMETHING ON THE STOVE?

SHE PUTS THE HEAT
UNDERNEATH IT.

WHAT IS SHE DOING?

BOILING.

BOILING. RIGHT.

YOU HEAT IT UP ON THE STOVE
UNTIL IT BUBBLES.

IT'S CALLED BOILING.

THIRD GRADE IS --

THEY'RE 8 AND 9 YEARS OLD,
AND THEY *LOVE* LEARNING.

THEY'RE VERY MOTIVATED.
IT'S JUST A NICE AGE.

I SEE IT AS A REAL PIVOTAL YEAR.

WE'VE HAD THE TRAINING WHEELS
TAKEN AWAY,

AND IT'S MY FAVORITE AGE.

Girl: A FEW MINUTES AGO,

WHEN WE WERE TALKING
ABOUT SOLIDS AND LIQUIDS,

WERE YOU SAYING THAT
A SOLID CAN'T BE A LIQUID?

WHAT DO YOU THINK ABOUT THAT?

AND GIVE US SOME REASONING
BEHIND YOUR THINKING.

WAS I SAYING THAT A SOLID
CAN'T BE A LIQUID?

SHELBY?

LIKE ICE -- IT CAN --

ICE IS A SOLID. BUT IF YOU KEEP
IT OUT IN WARM AIR TOO LONG,

IT WILL MELT.

AND THEN IT CAN BECOME A LIQUID
AND ALSO POPSICLES.

Jean: THEY HAD
SOME WONDERFUL QUESTIONS.

AND THEY'RE VERY GOOD ABOUT
EXPLAINING *HOW* THEY'RE THINKING.

SOMETIMES, IT TAKES A *LONG* TIME
TO GET THROUGH SOMETHING,

BUT I THINK
THAT'S REAL VALUABLE

BECAUSE THEY ALL THINK
IN VERY DIFFERENT WAYS.

AND I'M GLAD THEY SHARE IT
WITH EACH OTHER.

THEY'RE PRETTY GOOD

ABOUT LISTENING TO EACH OTHER'S
IDEAS AND OPINIONS.

READY?
ONE, TWO, THREE.

[EXHALING]

CATHERINE,
WHAT DID YOU FEEL?

I FELT, LIKE, AIR
AND WATER VAPOR COMING OUT

AND TOUCHING MY HAND.

AND WHAT DID YOUR HAND
FEEL LIKE?

IT ALMOST FEEL --

IT FELT LIKE
AIR WAS COMING --

LIKE STRONG AIR WAS COMING
AND HITTING IT.

THEY'RE VERY ACCEPTING
OF INDIVIDUAL DIFFERENCES.

THEY CELEBRATE
OTHER'S ACCOMPLISHMENTS.

THEY KNOW WHERE EVERYBODY STANDS
ACADEMICALLY.

THEY ALSO KNOW

THAT SOME OF THE ONES
THAT ARE STRONGEST IN ACADEMICS

AREN'T THE STRONGEST
IN ATHLETICS AND SO FORTH.

DOES IT SMELL GOOD?

YEAH.

EEUW!

Narrator: FOR THE PAST SEVERAL
YEARS, JEAN HAS BEEN DEVELOPING

MULTISENSORY APPROACHES
TO SCIENCE ACTIVITIES

THAT ATTEMPT TO MEET THE NEEDS

OF STUDENTS WITH WIDELY
DIFFERING LEARNING STYLES.

YEAH. IT CAN.

Jean: ARSEN
IS A RUSSIAN BILINGUAL CHILD.

HIS PARENTS AREN'T ABLE
TO WRITE OR READ IN ENGLISH.

AND SO HIS LEARNING OF ENGLISH
AND COMMUNICATING IN ENGLISH

HAPPENS HERE ONLY.

BUT HE WANTS VERY MUCH
TO LEARN AND TO SUCCEED.

[BOTH SPEAKING RUSSIAN]

HE NEEDS TO HAVE
INFORMATION PRESENTED

IN AS CONCRETE WAY AS POSSIBLE.

AND HE NEEDS
AS MANY DIFFERENT WAYS

OF A CONCEPT
BEING EXPLAINED TO HIM

THROUGH PICTURES AND HANDS-ON
AND PHYSICALLY MOVING

BECAUSE HE CAN'T GET IT
THROUGH THE READING.

JEAN'S CLASSROOM IS AN
UNBELIEVABLY CHALLENGING SETTING

FOR TEACHING SCIENCE.

SHE HAS SUCH A WIDE RANGE
OF STUDENTS.

TWO STUDENTS ARE INVOLVED IN
PART OF THE INCLUSION PROCESS.

SHE HAS MANY STUDENTS

WHO DO NOT HAVE ENGLISH
AS THEIR PRIMARY LANGUAGE.

SHE HAS SEVERAL STUDENTS

WHO ARE PHYSICALLY CHALLENGED
IN ANOTHER MANNER.

SHE HAS THIS WIDE SPECTRUM.

[Children sing]
...MINERALS IN THE WATER

WITHOUT THEM I'D BE DEAD

OOOOH

OH, MY ROOTS RUN DEEP

YES, DEEP INTO THE GROUND

SO MINERALS AND THE WATER
CAN BE...

Jean: LET THE BREEZES BLOW.

EVERYBODY LEARNS
IN A DIFFERENT WAY,

AND I THINK WE NEED TO ADDRESS
EVERY TOPIC IN EACH MODE

SO THAT THE KINESTHETIC LEARNERS

GET TO PUT THEIR HANDS
ON SOMETHING

AND PHYSICALLY DO IT EVEN IF
IT'S AN ABSTRACT CONCEPT.

THAT'S WHAT THEY NEED TO DO.

Boy: PROBABLY
IN THE MIDDLE OF THAT,

IT'S JUST LIKE AIR.

Boy: THAT'S
EXACTLY *WHAT* IT IS.

AND WE'LL HAVE JANNA LOOK
TO SEE WHETHER IT'S...

Jean:
I THINK THAT VISUAL LEARNERS
NEED TO HAVE AS MUCH STUFF
AROUND TO LOOK AT AS THEY CAN.

NOT YET.

DO YOU AGREE, ERIC?
IS THE WATER FREEZING YET?

CAN I FEEL IT?

YEAH. COLD.

BUT IS IT FROZEN,
THE WATER INSIDE?

NO.

WHAT I'M MOST INTERESTED IN
IS MULTISENSORY EXPERIENCES

FOR KIDS WHO INPUT AND OUTPUT
INFORMATION IN DIFFERENT WAYS.

MOST PEOPLE HAVE A COMBINATION.

AND I THINK THAT IT'S IMPORTANT

FOR KIDS TO HAVE
ALL OF THOSE EXPERIENCES

FOR WHATEVER YOU'RE TEACHING

SO THAT THEY CAN GRASP WHAT'S
EASIEST FOR THEM TO LEARN,

THE EASIEST WAY
FOR THEM TO LEARN,

BUT ALSO TO BE AWARE
OF THE OTHER WAYS

AND TO MAYBE DEVELOP THAT.

Boy: LOOK AT THIS!

LOOK AT THIS!

EEUW!!! DISGUSTING!

Boy: IT'S A LIQUID.
IT'S MOSTLY LIQUID.

YOU CAN SQUEEZE SOME
OF THE LIQUID OUT OF IT.

Boy: IT'S BOTH.

IT'S BOTH, DEFINITELY.

WE NEED TO DO
THE SHAPE TEST.

WE ARE GOING TO HAVE
A GRAND ADVENTURE

WITH A *VERY* MYSTERIOUS
MIXTURE OF POWDERS.

WHAT YOU'RE GOING TO DO
IS YOU'RE GOING TO USE

ALL THE INFORMATION
THAT YOU HAVE SO FAR,

THAT YOU'VE ACQUIRED.

YOU'RE EACH GOING TO GET
A POWDER.

AND WE'RE JUST GOING TO SEE

HOW MANY SCIENTISTS FIGURE
OUT WHAT THEIR POWDERS ARE.

Narrator: THIS ACTIVITY
CHALLENGES THE STUDENTS

TO IDENTIFY
THE SUBSTANCES PRESENT

IN A MIXTURE OF UNKNOWN POWDERS.

Boy: HERE, WHY DON'T YOU
GRAB THE POWDER?

DECIDE ON A PROCEDURE
OF HOW YOU'RE GOING TO TEST IT

BEFORE YOU BEGIN TESTING.

TALK ABOUT IT
WITH YOUR PARTNER.

Boy: PUT A LITTLE BIT ON.
OKAY. THAT'S GOOD.

Narrator: THE STUDENTS

REFER TO DATA THEY HAD COLLECTED
THROUGHOUT THE UNIT

TO HELP THEM SOLVE THE MYSTERY.

THE ACTIVITY WAS TO ASSESS
WHETHER OR NOT THEY UNDERSTOOD
THE DIFFERENCES IN POWDERS
AND WHAT INDICATORS DID.

Boy: YOU DO THE WATER.
I'LL DO THE VINEGAR.

Jean: THE MATERIALS IN THIS UNIT
ARE THE REASON
WHY PEOPLE AVOID IT.

THEY HAVE A HANDLED TRAY,
ONE PER TABLE.

I ALSO, WHEN WE STARTED
THIS UNIT, REARRANGED THE DESKS

SO THAT THEY WOULD BE
IN SMALLER GROUPS.

I TRIED TO THINK OF EVERYTHING
THEY MIGHT NEED

AND WHAT THE SPILL EFFECT IS
GOING TO BE IN A CARPETED ROOM.

THEY ALL KNOW THAT NOTHING
CAN GO IN THE SINK,

AND THAT IS HAS TO GO
IN A WASTE RECEPTACLE.

THEY ALSO KNEW BEFORE

THAT THEY WEREN'T SUPPOSED
TO GET UP AND WALK AROUND

WITH THE MATERIALS.

SO THE STRUCTURE
WAS PRETTY FIRM.

I THINK IT HAS TO BE AT FIRST.

THEN THEY CAN HANDLE IT
MUCH BETTER.

IT IS A MATTER OF THINKING,
AND IT DOES TAKE EXTRA TIME,

BUT THE TIME SPENT IN ORGANIZING
IT IS *WELL* WORTH WHILE.

THAT'S PROBABLY THE KEY --

A BIG KEY TO SUCCESS
WITH THIS UNIT

IS THINKING AHEAD
AND WHAT THEY'RE GOING TO NEED

AND HAVING MORE THAN WHAT
THEY'RE GOING TO NEED AVAILABLE.

HEY, IT FIZZED A LITTLE!

FIZZING. YEAH.

IT IS.
TRY ONE MORE.

Jean: THESE KIDS

WORK PRIMARILY IN COOPERATIVE
GROUPS OF TWO, THREE, OR FOUR.

THERE'S DEFINITELY
BAKING SODA.

BIG TIME.

THEY UNDERSTAND THAT THEY NEED
TO SHARE ROLES VERY OFTEN.

SO SOMETIMES THERE'S ONE PERSON
WITH THE PENCIL AND SO FORTH,

AND THEY CHANGE THEM AROUND.

THEY UNDERSTAND
THAT THE SUCCESS OF THEIR GROUP

DEPENDS ON WHETHER
ALL THE MEMBERS OF THEIR GROUP

HAVE AN UNDERSTANDING
OF WHAT'S GOING ON.

POWDERS IT COULD NOT BE --
WE DON'T KNOW THAT YET.

I THINK IT'S NOT SALT.

I DON'T KNOW.

WHAT WOULD BE THE BEST WAY
TO FIND OUT SALT? WATER.

SO LET'S TRY WATER
RIGHT NOW.

Jean: WHAT DOES IT
FEEL LIKE, KIM?

LIKE...EITHER SUGAR OR SALT

MIXED WITH CORNSTARCH
OR BAKING SODA.

WHAT IF YOU LOOKED BACK
IN YOUR LAB NOTEBOOK?

WOULD THAT HELP YOU

TO SEE WHAT HAPPENS WITH
SOME OF THOSE OTHER POWDERS?

THE STUDENTS HAD TO OBSERVE.

THEY HAD TO FEEL.
THEY HAD TO SMELL.

THEY HAD TO PUT, SAY, VINEGAR
ON THERE, IODINE -- HEAT IT.

WHAT THEY HAD TO DO
WAS TO TAP INTO PRIOR KNOWLEDGE.

AND IF THEY DIDN'T HAVE
THAT PRIOR KNOWLEDGE,

THEY WOULDN'T HAVE KNOWN
WHERE TO BEGIN.

IT WAS A VERY ORGANIZED MANNER
OF TESTING.

THEY COULDN'T JUST HAPHAZARDLY
THROW CHEMICALS TOGETHER.

SO THE SYSTEMATIC WAY
OF RESEARCHING WHAT THEY HAD

WAS A GOOD INDICATION

THAT THEY UNDERSTOOD THE
PREVIOUS PROCESS OF INDICATORS.

HOW MUCH SHOULD I DO?

FIRST, TWO DROPS,
THEN FOUR.

HEY, WAIT A MINUTE!
THERE MIGHT BE CORNSTARCH.

IT LOOKS A LITTLE BIT
LIKE BLACK.

OH, YEAH.

Mason: THEY WERE GOING THROUGH
A PROCESS OF ELIMINATION.

THEY WERE SAYING, "THIS
CAN'T BE. IT DOESN'T FEEL RIGHT.

IT DIDN'T REACT RIGHT."

SO THEY'RE THINKING
THIS THROUGH.

THEY HAVEN'T MEMORIZED
WHAT'S GOING ON.

THEY'VE UNDERSTOOD IT.

SO YOU THINK IT'S WHAT?

CORNSTARCH AND SALT.

BECAUSE?

IT BURNT
LIKE THE CORNSTARCH,

AND THE SALT DIDN'T MAKE
THAT BIG OF A REACTION.

IT JUST TURNED
A LITTLE BIT DARKER.

IT'S HARD TO SEE

'CAUSE ALL THE CORNSTARCH
TURNED DARKER.

THIS HEAT TEST IS GOING
TO DECIDE WHETHER IT'S...

SUGAR OR SALT.

WHAT DO YOU EXPECT WILL
HAPPEN IF IT'S SALT?

IT WILL DO NOTHING.

IT'S SMOKING.

IT SMELLS LIKE CARAMEL.

WHAT DO YOU THINK?

BAKING SODA AND SUGAR.
BAKING SODA AND SUGAR.

DID THE HEAT TEST
HELP YOU TO DECIDE THAT?

YEAH.
YEAH.

WANT ME TO READ THEM AGAIN?

Narrator: REBECCA
IS A SPECIAL EDUCATION AIDE

WHO WORKS FULL TIME
IN JEAN'S CLASSROOM.

LET'S WRITE THAT DOWN.

Rebecca: ONE OF THE STUDENTS
DID NOT REALLY UNDERSTAND

WHAT WAS THE PURPOSE
OF AN INDICATOR,

OH HOW MUCH EASIER IT WOULD BE

TO FIGURE OUT
WHAT THE MIXTURES WERE.

YOU PUT 10 DROPS
OF IODINE IN HERE.

Rebecca: WE HAD DISCUSSED IT,
AND THERE'S NO VISUAL CUES.

IT WAS CLEAR TO ME THAT
THIS PERSON NEEDED A VISUAL.

THE AUDITORY DISCUSSION
DID NOT WORK FOR HIM.

WHAT HAPPENED?
WHAT'S IT LOOK LIKE?

IT LOOKS LIKE, UM...

OKAY, ERIC.
WHAT HAPPENED TO IT?

WHAT DID IT DO?

IT TURNED BLACK.

SO LET'S WRITE THAT DOWN.

IT -- "I," "T" --
TURNED -- "T," "U," "R"...

I FELT
MAYBE I SHOULD HAVE SUGGESTED,

"WHY DON'T WE HAVE
A POSTER OF THE INDICATORS?"

IF THAT WAS UP THERE, THEN THAT
PERSON WOULD HAVE UNDERSTOOD

WHAT AN INDICATOR WAS.

YEAH? LIKE WHAT?

"S" --

"O"...

Jean:

WHAT DO YOU THINK, KIM?

I AGREE WITH KIM NOW.
IT'S SALT.

I'M STILL NOT SURE.

MICHAEL THINKS
IT'S SUGAR,

AND YOU THINK
IT'S SALT?

NO. I THINK IT'S SALT.

AND SHE THINKS
IT'S SUGAR?

THEY DID A LOT OF COMPROMISING.

NOT ONLY DID THEY COMPROMISE,

THEY LISTENED TO ONE ANOTHER
AND, IN SOME CASES,

CHANGED THEIR IDEA
TO THE OTHER PERSON'S IDEA,

WHO, AT THE SAME TIME,
WAS CHANGING IT TO THEIR IDEA.

I THOUGHT THAT WAS GREAT
AND THAT THEY WERE THAT WILLING

AND THAT THEY WOULD ADMIT

THAT YES, INDEED,
THEY HAD BEEN CONVINCED,

BUT THEY
HAD CONVINCED EACH OTHER,

AND THEY WERE THEN
ON OPPOSITE SIDES OF THE FENCE.

YOU'RE ABSOLUTELY POSITIVE?

YEAH.
YEAH.

HOW COULD YOU BE POSITIVE

IF YOU HAVEN'T DONE
THE VINEGAR TEST?

WE DID.
WE JUST DID.

SHOW ME WHAT HAPPENED.

I DON'T SEE
ANY RESULTS HERE.

WE PUT TWO DROPS.

WHAT ELSE COULD YOU DO?

PUT FOUR DROPS.

HAVE YOU COMPARED IT

TO YOUR VINEGAR RESULTS
IN YOUR LAB NOTEBOOK?

NO.

NO.

OKAY.

ALL OF THE GROUPS

FIGURED OUT WHAT THE POWDERS
WERE ONE WAY OR ANOTHER.

WE'D SPEND A LOT OF TIME
THINKING AND TALKING

AND ACTING THESE THINGS OUT

AND DOING THEM IN EVERY MODE
THAT WE POSSIBLY COULD.

I THINK THAT FOR EACH ONE
OF THESE KIDS,

THEY ABSORB
A LITTLE BIT OF INFORMATION

IN ALL OF THE DIFFERENT WAYS.

AND SO IT
SORT OF CEMENTED ITSELF

LIKE THE PLASTER OF PARIS IN
THEIR BRAINS IN DIFFERENT WAYS.

I THINK
THAT IT WOULD BE VERY HARD

TO PICK OUT EXACTLY WHICH WAY
ONE PERSON LEARNED.

I THINK THEY PICKED UP A LITTLE
BIT FROM ALL THEIR EXPERIENCES.

I THOUGHT IT WOULD BE
PLASTER OF PARIS AND SUGAR.

AND THEN TO MAKE SURE,
WE ASKED YOU TO GET US

SOME PLASTER OF PARIS
AND SUGAR IN SEPARATE CUPS.

SO THEN WE MIXED THEM
TOGETHER, AND WE FELT THEM.

AND WE FELT THE OTHER TWO
THAT WERE MIXED TOGETHER,

AND THEY FELT THE SAME,
SO THAT'S HOW WE --

Jean:

SO YOU MADE A COMPARISON?

YOU CREATED YOUR OWN POWDER.

WE THOUGHT
IT WAS CORNSTARCH,

AND THEN WE DID
THE IODINE TEST.

WE'RE POSITIVE
THAT IT *IS* CORNSTARCH.

IT WAS SORT OF HARD TO FIGURE
OUT IF IT WAS SUGAR OR SALT.

I THOUGHT IT WAS SALT,

AND THEN MICHAEL THOUGHT
IT WAS SUGAR.

WHEN WE DID THE HEAT TEST,
HE THOUGHT IT WAS SALT,

AND THEN I THOUGHT
IT WAS SUGAR.

FINALLY,
WE BOTH THOUGHT IT WAS SALT.

AND WE KNEW IT WAS BECAUSE WE
COULD TELL BY THE HEAT TEST.

WE WANT TO MOVE ON

TO A REALLY, REALLY
HARD ONE, A CHALLENGE.

AND WE WANT TO PUT,
LIKE, FOUR IN.

DO YOU THINK
YOU CAN SOLVE THAT,

THE TWO OF YOU?

YES.

Mason: THIS TYPE
OF AN ASSESSMENT HAS SHOWN

THAT WHEN YOU ALLOW STUDENTS
TO STUDY A PARTICULAR CONCEPT

FROM A VARIETY OF WAYS,
USING ALL OF THEIR SENSES,

IT'S REALLY PRETTY POWERFUL.

DOES IT SMELL GOOD?

YEAH.

EEUW!

Mason: WE DON'T JUST USE
ONE OF OUR SENSES

WHEN WE'RE DEALING
WITH SCIENTIFIC INVESTIGATIONS.

IT'S SO GREAT TO HEAR THOSE
CHILDREN TALKING IN THIRD GRADE

ABOUT WHY A PARTICULAR COMPOUND
IS STARCH OR WHY IT *ISN'T*.

Jean: WHAT DID YOU THINK WAS
IN THE MYSTERY POWDER, ARSEN?

SUGAR AND CORNSTARCH.

WHAT MADE YOU THINK
IT WAS CORNSTARCH?

BECAUSE IT LOOKED PURPLE.

AND YOU THINK IT'S...

PLASTER OF PARIS
AND BAKING SODA.

EXCELLENT. IT IS.

MINE'S UP HERE.

YEAH, I WANT
ALL YOUR PAPERS.

HERE'S OUR FIRST ONE --
THE FIRST AND SECOND ONE.

THIS IS THE FIRST ONE.

WHERE DOES IT GO THEN?
SHOW ME WHAT NUMBER.

RIGHT HERE.

Narrator: THE LAST SCIENCE UNIT
OF THE YEAR

IS A STUDY OF AMPHIBIANS,
CENTERED
ON THE CAREFUL OBSERVATION
OF THE FROG'S UNIQUE LIFE CYCLE.

TRY TO KEEP IT OFF
OF THE FLOOR.

Narrator:
AS SHE CONCLUDES THIS UNIT,

JEAN IDENTIFIES THE NEED
TO BETTER ASSESS STUDENTS

WITH WIDELY DIFFERING
LEARNING STYLES.

Jean: THE MAIN IDEA OF THIS
WAS FOR THEM TO BE ABLE
TO CREATE A 3-DIMENSIONAL MODEL
OF THE STAGES OF DEVELOPMENT
IN AN AMPHIBIAN.

WE'VE DONE A LOT OF WORK WITH IT
USING PICTURES

AND TALKING ABOUT IT
AND OBSERVING THE ACTUAL FROGS.

BUT I WANTED THEM TO CREATE IT
WITH THEIR HANDS

SO THAT KIDS WHO HAVE TROUBLE
WRITING ABOUT IT

MIGHT BE ABLE TO DO IT.

AND KIDS WHO MIGHT HAVE TROUBLE
DRAWING MIGHT FIND IT EASIER

IF THEY WERE ACTUALLY
MANIPULATING THE CLAY.

Boy: YOU LOOK LIKE A MONSTER.

Jean:
THE PURPOSE OF THE 3-D MODEL

WAS TO HAVE
SOME HANDS-ON EXPERIENCE

IN CREATING THE STAGES
OF THE TADPOLE'S DEVELOPMENT

INTO A FROG

AND TO SEE IF THEY KNEW THE
DIFFERENT PARTS OF THE TADPOLE

AND AS IT CHANGED TO A FROG

AND IF THEY UNDERSTOOD
THE SEQUENCE OF DEVELOPMENT.

AS I WALKED AROUND,
THERE WERE SOME SURPRISES.

SOME OF THE CHILDREN
WHO DO VERY WELL DRAWING

WERE HAVING HUGE DIFFICULTY
IN CREATING A SCULPTURE.

Girl: YOU'RE ALL DONE.

IS THE TAIL ROUND
OR IS IT FLAT?

LIKE THIS.

THEN MAKE IT FLAT.

Boy: I THINK THESE LITTLE
BEANS ARE NEAT AS EGGS.

MY OTHER OBJECTIVE WAS TO HAVE
THEM WRITE AS MUCH AS THEY COULD

ABOUT WHAT THEY LEARNED
IN GENERAL AND IN PARTICULAR

ABOUT AMPHIBIANS.

THERE WAS A PAGE
THAT HAD JUST LINES.

AND THEN THERE WERE TWO PAGES

THAT HAD A BOX
WHERE THEY COULD PUT A PICTURE.

I WANTED THEM ALL
TO TRY TO DO SOME WRITING,

BUT I WANTED TO GIVE THE KIDS

FOR WHOM THE WRITING
IS DIFFICULT

AN OPPORTUNITY
TO DRAW A PICTURE.

OH, NICE, ARSEN.

THANK YOU.

NOW YOU'RE GOING TO WRITE
IN WORDS ABOUT FROGS,

ANYTHING YOU KNOW.

OKAY.

IF YOU WANT
TO TAKE A PICTURE PAGE,

YOU CAN DO THAT.

SO YOU'D WRITE DOWN --

I WANT THE WRITING.

THE WRITING?

YEAH.

OKAY.

*FROGS ARE AMPHIBIANS.
AMPHIBIANS ARE UNDER A LOG.*

THEY JUMP FAST...

I LEARNED

*THAT SOME FROGS USE CAMOUFLAGE
AND SEVERAL OTHER WAYS*

TO ESCAPE FROM ENEMIES.

SALAMANDERS
CAN EAT SOME FROGS,

BUT TOADS
CAN EAT SALAMANDERS.

OH, THAT'S INTERESTING.

WHAT ELSE CAN YOU TELL ME
ABOUT SALAMANDERS?

Jean: FOR THOSE CHILDREN

FOR WHOM THE PHYSICAL ACTIVITY
WAS DIFFICULT,

I FELT THAT THE WRITING
MIGHT BE EASIER FOR THEM.

I RAN OUT OF TIME.

OKAY, BUT YOU WROTE A LOT.
AND YOU KNOW WHAT?

I LOVE THE WAY YOU USED
YOUR TIME, MICHAEL.

IT WAS EXCELLENT.

I RAN OUT OF TIME.

DID YOU PUT THAT DOWN?

YEAH.

WHAT I'M LOOKING FOR IS,
DO THEY UNDERSTAND LIFE CYCLE,

DO THEY UNDERSTAND THAT
AMPHIBIANS LAY LOTS OF EGGS,

AND THAT THE FOOD CHAIN
IS INVOLVED?

JUST SORT OF BASIC POINTS.

AND DID THEY REMEMBER THINGS

FROM THEIR OBSERVATIONS
OF THE FROGS?

OR I THINK I'LL BE ABLE TO TELL

WHERE THE INFORMATION
IS COMING FROM,

FROM ACCORDING
TO WHAT THEY PUT DOWN.

I SHOULD HAVE WORN
MY SNEAKS FROM BASEBALL.

Narrator: THE FINAL ACTIVITY
OF THE AMPHIBIAN UNIT

IS A FIELD TRIP
TO A NATURE RESERVE.

A BOTTLE!

PEOPLE LITTER!

Jean: THESE ARE BASICALLY
CITY CHILDREN.

THEY DON'T SPEND TIME
IN THE WOODS.

WE SAW THIS
AT THE ARBORETUM.

DO YOU REMEMBER WHAT IT WAS?

Jean: ABOUT 10 YEARS AGO,

I HAD A LITTLE BOY,
AND WE WERE OFF DOING THIS.

AND HE SAID TO ME,

"THIS IS LIKE A TEST

"OF EVERYTHING WE'VE LEARNED
ALL YEAR.

I LOVE IT."

IT REALLY IS, ISN'T IT?

SO THEY GO AND THEY OBSERVE

AND THEY CONNECT THINGS
ON REAL TREES,

NOT LAMINATED PIECES OF PAPER,

WITH, HOPEFULLY, WHAT
THEY'VE BEEN EXPOSED TO HERE.

RIGHT HERE. YEAH.

YOU GUYS
GET ON THE OTHER SIDE.

NO, YOU GET READY
WITH THE NET.

NO, YOU GET OVER THERE.

ME?

COME ON.

NO, NO.

THERE WE GO.
WE GOT IT UP.

Jean: YEAH? WHAT?

NOPE.
THERE'S NOTHING UNDER THERE.

YOU FOUND ONE?

SOMEONE FOUND THEM!
MOVE IT!

WHERE?!

KEEP IT UNTIL WE COME!

SEE? THAT'S HOW BIG
IT IS *REALLY*.

HOW DID YOU CATCH HIM?

OUR LEADER KICKED THE LOG
OPEN, AND I SAW A WORM.

I THOUGHT IT WAS A WORM.

THEN I THOUGHT
IT WAS A SNAKE

'CAUSE I DIDN'T SEE
THE LEGS.

THEN I SAW THE LEGS
AND KNEW IT WAS A SALAMANDER.

OKAY, THE BACK COVER
OF THE BOOKLET SAYS

"DRAW AN AMPHIBIAN WHICH
BELONGS TO THE TAILED GROUP."

DRAW IT FROM YOUR MEMORY.
IT DOESN'T HAVE TO BE EXACT.

CAN I SEE IT?

Man: ALL RIGHT?

IT'S THE SNAKE ON THE ROCK.

Jean: OKAY.

IF YOU WANT TO DRAW
THE SNAKE, LABEL WHAT...

Man: KIND OF CLOSE
TO MAIN STREET, THOUGH.

IS THAT WHERE
THEY FOUND HIM?

Jean: WHAT I'VE LEARNED THIS
YEAR IS THAT IT'S REALLY HARD

TO MEASURE SPECIFICALLY
HOW A PERSON LEARNED SOMETHING,

PARTICULARLY
IF THEY'RE RECEIVING IT

IN MANY DIFFERENT WAYS.

AND SO TO PINPOINT PRECISELY HOW
SOMEONE LEARNED IS DIFFICULT.

I'M NOT SURE THAT IT'S WORTH
SPENDING A HUGE AMOUNT OF TIME

FIGURING OUT
EXACTLY HOW THEY LEARNED IT.

BUT WHAT I DO THINK IS IMPORTANT

IS THAT YOU PRESENT THE MATERIAL
IN MANY DIFFERENT WAYS

SO THAT WHAT'S COMFORTABLE
FOR THEM IS THERE

AS A MODE TO RECEIVE IT,

BUT ALSO THE OTHER AREAS WHERE
MAYBE THEY'RE NOT AS STRONG,

MAYBE THEY WOULD DEVELOP THEM
IF THEY HAD THE EXPERIENCES.

DON'T THINK
WE HAVE MUCH PLANKTON.

WE DO. LOOK INSIDE THERE.
SEE ALL THOSE THINGS?

THAT'S PLANKTON.
ALL THAT STUFF.

WE HAVE A LOT.

WE HAVE A *LOT* OF PLANKTON.

LET'S MAKE A LIST OF SOME
THINGS THAT YOU COULD DRAW.

MICHAEL?

THE TREE THAT HAS
ALL THE HOLES IN IT.

THE WOODPECKER TREE.
WHAT ELSE? CATHERINE?

THE SALAMANDER.

HOW MANY KINDS

OF SALAMANDERS DID WE SEE?

TWO.
TWO.
TWO.

WHAT WERE THEY?

RED-BELLIED.

RED-BACKED.

DUSKY.

Jean: WHAT THIS HAS DONE FOR ME

IS TO OPEN UP AN AREA
THAT WAS OF INTEREST TO ME,

BUT NOW TO LOOK AT IT THROUGH
THE ASSESSMENT POINT OF VIEW.

AND THE THIRD-GRADE TEACHER
THAT I'M WORKING WITH AND I --

WE ALWAYS SAY, "BUT HOW ARE WE
GOING TO ASSESS THIS?"

SO WE'RE TRYING TO DO MULTIPLE
WAYS OF ASSESSING THINGS,

GATHERING LOTS OF INFORMATION,

SO THAT THERE ARE
LOTS OF OPPORTUNITIES FOR KIDS

TO SHOW THEIR UNDERSTANDINGS
OR MISUNDERSTANDINGS.

Jean: WHAT ELSE COULD YOU
DRAW OR WRITE ABOUT? JODIE?

Girl: THE POND,
THE WATERFALL, THE SNAPPING.

THE POND, THE WATERFALL,
THE SNAPPING TURTLE.

THE TURTLE!

THE TURTLE, RONNY.
EXCELLENT.

THE FIVE LEAVES
WITH THE LITTLE FLOWER.

WASN'T THAT PRETTY?

DO YOU THINK YOU CAN FILL UP
THAT LITTLE YELLOW BOOKLET?

YEAH.
YEAH.

WHERE IT SAYS "REFLECTIONS,"

YOU CAN WRITE
WHAT YOU THOUGHT,

WHAT YOU LIKED,
WHAT YOU WONDERED ABOUT.

WHAT DOES "REFLECTION" MEAN?

"REFLECTION" MEANS
TO THINK ABOUT.

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