

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

ANYBODY CAN DO SCIENCE.

BUT, THEN AGAIN,
YOU HAVE TO WORK AT IT

TO SEE THE THRILL OF ACTUALLY
DOING AN EXPERIMENT

AND WATCHING THEIR PEA GROW

OR TAKING CARE OF A FISH
OR SOMETHING.

THAT HELPS THEM GET CONFIDENCE
IN THEMSELVES.

SO, WORMS
HAVE LITTLE BUGS.

WE ONLY NEED ONE
TO EXAMINE IT.

YEAH, BUT THERE'S A BUNCH
OF WORMS THAT HAVE DIRT

AND ANTS ON IT,
AND THEY'RE DIFFERENT.

I HEAR MOST CHILDREN SAYING,

"OH, I HATE SCIENCE!"

BEFORE MY LAST LESSON,
A LITTLE GIRL CAME UP

AND WAS LIKE, "I DON'T
LIKE SCIENCE, MISS MORGAN."

AND I SAID, "I'M GOING TO ASK
YOU THAT *AFTER* THE LESSON,

AND I WANT TO SEE
WHAT YOU TELL ME THEN."

SHE SMILED AND SAID,
"I GUESS I LIKE IT NOW."

YOU CAN GO
ANYWHERE YOU WANT.

YOU CAN GO DOWN HERE.

THE OTHER SIDE OF THE FIELD
OVER BY THE FENCE.

I'M GOING DOWN THERE.

OKAY.
ANYWHERE YOU WANT.

THE SCHOOL WAS BUILT
ON WETLANDS.

IT'S ABOUT FIVE YEARS OLD.

THEY HAD TO GO THROUGH
ALL THE EPA AND ALL THE STUDIES

IN ORDER TO GET IT BUILT.

AND WE'RE GOING TO DEVELOP
A WETLAND UNIT FOR THE SCHOOL

TO TEACH THE KIDS
ABOUT THE WETLANDS.

I WAS AN ENVIRONMENTAL SCIENCE
MAJOR IN COLLEGE.

I TOOK A LOT OF GEOLOGIES,
HYDROGEOLOGIES,

AND ALL THE SCIENCES,

AND I DECIDED I DID NOT WANT
TO WORK IN A LAB.

SO, I APPLIED AT LOWELL,
AND I GOT IN.

SO, NOW I'M
IN THE MASTERS PROGRAM THERE.

ERIEN IS DEFINITELY GOING TO BE
A TEACHER OF THE 21st CENTURY.

THEIR PHILOSOPHY IS HANDS-ON,
COOPERATIVE GROUPING,

A LOT OF DISCUSSION,
REAL-WORLD PROBLEMS.

I BELIEVE
THAT HER GRADUATE COURSES

HAVE JUST PUSHED HER
IN THE RIGHT DIRECTION.

THEY'RE PREPARING HER
FOR WHAT IS AHEAD.

IF YOU WANT TO,
GET DOWN THIS WAY

A LITTLE BIT MORE, OKAY?

WE DON'T WANT TO HAVE
EVERYBODY AT THE SAME SPOT.

I CAN'T GET
THESE SNEAKERS WET.

Erien:
IT'S JUST A WONDERFUL JOB.

I CAN'T FALL ASLEEP AT NIGHT

BECAUSE I'M EXCITED
FOR THE NEXT DAY.

AND I WAKE UP AND I CAN'T WAIT
TO GET TO SCHOOL.

SO, I THINK
I MADE THE RIGHT CHOICE.

I *KNOW* I MADE THE RIGHT CHOICE.

ALL RIGHT, TODAY WE'RE GOING
TO BEGIN THE WETLAND UNIT

STUDYING THE SOILS.

BEFORE WE
CAN EVEN GO OUTSIDE,

WE WANT TO FIND OUT
HOW MUCH YOU ALREADY KNOW

ABOUT WHAT THE SOILS
WILL LOOK LIKE.

SO, BEFORE WE CAN GO,
WHO HERE HAS ANY IDEAS?

IT'S GOING TO BE SLIPPERY
NEAR THE WATER.

EXCELLENT.

OKAY, JASON.

IT WILL BE DRY ONCE
YOU GET INTO THE FIELD.

DRY WHEN WE GET
INTO THE FIELD.

WE WERE TAUGHT THAT WE SHOULD
ASK LOTS OF QUESTIONS.

FIND OUT WHAT THEY KNOW,
HOW MUCH THEY KNOW,

AND WHAT THEY WANT TO KNOW.

YOU MIGHT BE TEACHING SOMETHING

THAT THEY THINK
THEY ALREADY KNOW,

BUT THEY MIGHT HAVE THAT
ALL OFF.

IF YOU'RE TRYING TO ADD TO IT,

THEY'RE JUST GOING TO BE
MORE CONFUSED.

YOU HAVE TO CLEAR UP
WHAT MIGHT BE WRONG,

AND THEN ADD TO THEIR KNOWLEDGE.

NEAR THE WATER,

IT WILL BE SINKING
AND SINKING AND SINKING.

IT WILL BE LIKE...

SINKY. I DON'T KNOW.

WHAT'S A GOOD WORD
FOR THAT?

IT'S GOING TO BE SINKY
BY THE WATER.

MUDDY, MUSHY.

ANYBODY ELSE HAVE ANYTHING?
PATRICK?

MOIST.

MOIST? VERY GOOD.

IN THE FIELD,
THE SOIL WILL BE LIGHTER.

SO YOU THINK
IT'S GOING TO BE

LIGHTER-COLORED IN THE FIELDS
THAN IN THE WETLANDS?

WHY DO YOU THINK
THAT MIGHT BE SO?

BECAUSE THE SUN SHINES
RIGHT THROUGH THE GRASS

AND FOR MAYBE A TOP LAYER,

IT WILL BE LIGHTER
THAN THE WETLANDS

BECAUSE IT'S ALL TREES.

I THINK
THAT'S REALLY IMPORTANT

THAT THEY HAVE
THE CONFIDENCE TO KNOW

THAT THEY HAVE KNOWLEDGE
IN SCIENCE,

AND THEY CAN TALK ABOUT IT.

IT'S NOT JUST SOMETHING
YOU WRITE,

OR A MULTIPLE-CHOICE TEST,

THAT SCIENTISTS TALK
TO EACH OTHER ALL THE TIME.

....MOIST SOIL, SO THERE
MIGHT NOT BE THAT MANY.

Narrator:
ERIEN MET WITH TOM DANA,

A SCIENCE EDUCATOR FROM
PENNSYLVANIA STATE UNIVERSITY.

TOGETHER, THEY DISCUSSED IDEAS

FOR PROMOTING
STUDENT-CENTERED LEARNING

WHILE MAINTAINING FOCUS
ON SPECIFIC LEARNING GOALS.

IT'S BASICALLY MANAGEMENT.

I MEAN, THAT'S THE HARDEST ISSUE
AS A NEW TEACHER ANYWAY.

YOU HAVE SO MANY GREAT IDEAS,
AND YOU WANT TO DO IT ALL,

BUT HOW ARE YOU
GOING TO MANAGE IT ALL?

ESPECIALLY WITH THE QUESTIONS
AND THE CLASSROOM DISCUSSION?

EACH GROUP
WILL DIG ONE HOLE.

SO THE THREE OF YOU,
TWO OF YOU, FOUR OF YOU

WILL JUST DIG ONE HOLE

ANYWHERE YOU WANT
IN THE BACK FIELDS.

TRY TO STAY AWAY
FROM OTHER GROUPS

SO WE HAVE MORE VARIETY
OF SOILS BEING TESTED.

YOU NEED TO FILL IN
THE TEXTURE

AND THE MOISTURE
OF THE SOIL.

YOU NEED TO FEEL IT
AND DESCRIBE IT

BECAUSE WHEN
WE COME INSIDE TODAY,

YOU'RE GOING TO DESIGN
A POSTER WITH YOUR GROUP

THAT SHOWS WHAT
YOUR SOIL LOOKED LIKE.

YOU COULD EVEN TAPE
WHAT YOU FIND TO THE POSTER.

I DON'T WANT THEM TO FEEL LIKE

THEY HAVE TO BE FOLLOWING IT
STEP BY STEP.

I WANT THEM TO BE ABLE
TO COMPLETE THE WORK SHEET.

HOW THEY COMPLETE IT
IS UP TO THEM

AS LONG AS IT'S COMPLETED.

Boy:
IT'S GETTING DARKER.

Erien: ARE YOU
GETTING ROCKS, TOO?

HERE'S A PIECE OF --

YOU CAN REALLY SEE
THE DIFFERENT COLORS.

THAT'S A GREAT PIECE.

WHAT'S DOWN THERE RIGHT NOW?
PARTICLES?

LIKE, ANIMALS AND STUFF?

IT SAYS, "SOIL PARTICLES.
WHAT IS THE SAMPLE MADE OF?"

IF IT'S SAND,
IT WOULD FEEL GRITTY.

MINERALS,
MAYBE TINY BITS OF ROCKS.

CLAY -- A HINT TO KNOW
IF YOU HAVE CLAY,

IS IF YOU CAN MAKE A BALL.

PAT, WERE YOU ABLE TO MAKE
A BALL WITH YOUR SOIL?

THAT'S A GOOD CLUE
TO LET YOU KNOW

THAT YOUR SOIL HAS
A LOT OF CLAY IN IT.

SILT --
IT FEELS LIKE FLOUR.

PEBBLES -- YOU CAN SEE
THE LITTLE PEBBLES.

A LOT
OF ORGANIC MATTER --

LIKE, IF YOU FIND ANY PARTS
OF DECOMPOSED LEAVES.

WHAT'S THE TEXTURE
FEEL LIKE?

I KNOW
WHAT IT FEELS LIKE.

IT FEELS
LIKE COOKED NOODLES.

IT FEELS GOOD!

WHAT DOES IT FEEL LIKE?

IT FEELS LIKE COOKED RICE,
MUSHY COOKED RICE.

MASHED POTATOES!

LOOK WHAT I FOUND!

Dana: SO WHAT ARE SOME WAYS

THAT YOU WOULD PROMOTE
THEIR TALKING ABOUT SCIENCE?

HOW THEY MAY
ANSWER QUESTIONS.

I'D CONSTANTLY
GO BETWEEN THE GROUPS

AND ASK THEM QUESTIONS

THAT THEY MIGHT NOT BE
THINKING ABOUT.

THEN THEY'LL BE LIKE,
"OH, YEAH, THAT'S BECAUSE..."

LET'S SAY YOU HAVE
AN ACTIVITY GOING ON,

AND THE KIDS
ARE WORKING IN GROUPS.

YOU CAN GO AROUND
AND REALLY ASK SOME QUESTIONS

THAT WOULD BE ITEMS THEY
HADN'T THOUGHT ABOUT BEFORE,

OR IT COULD BE TO EXTEND
THEIR THINKING ABOUT SOMETHING

THAT THEY ALREADY

HAVE ACCOMPLISHED.

MAYBE HELP THEM CLARIFY
AND GET FOCUSED ON AN IDEA.

BOYS, HOW MUCH FURTHER
IS THIS SPOT?

IT'S RIGHT OVER THERE.

THEY PRETTY MUCH
TELL YOU EVERYTHING ABOUT IT

THE MINUTE YOU GET THERE.

THEY'RE JUST SO EXCITED.

THEN YOU JUST TRY TO BRING MORE
ATTENTION TO CERTAIN POINTS,

LIKE THINGS ON THE CHART

THAT THEY'RE PROBABLY
GOING TO OVERSEE

IF SOMEBODY DIDN'T POINT IT OUT,
LIKE THE TEXTURE.

DID YOU FEEL THE SOIL?
IS IT WETTER DOWN BELOW?

IS IT COLDER? IS IT WARMER?

I'VE GOT IT.

YOU'VE GOT IT?

WAIT A SEC.

IT'S NOT A ROCK.

OH, YEAH.
IT IS ON THAT SIDE.

NOTICE ANYTHING
ABOUT THE ROCK?

WHAT'S THIS?

NO, THE ROCK'S
DOWN THERE.

TELL ME ABOUT THIS ROCK.
FEEL THIS ROCK.

IT'S MOIST.

IT FEELS LIKE IT'S WET,
DOESN'T IT?

IT IS WET!
YOU GUYS, FEEL THIS!

WHOA! THAT'S WET.

I THINK THERE'S
WATER DOWN THERE.

Dana: WE REALLY WANT CHILDREN

TO BE EXPLORERS
AND INVESTIGATORS.

AND WE WANT THEM TO TRY
TO DICTATE FOR THEMSELVES

WHAT IS THE PROBLEM
THEY SHOULD BE EXPLORING

AND WHAT WAYS ARE THEY GOING TO
GO ABOUT EXPLORING THAT PROBLEM?

BUT THAT'S A REALLY DIFFICULT
ACTIVITY FOR MOST ADULTS,

LET ALONE FOR MOST CHILDREN.

I THINK THAT MOST TEACHERS WHO
DO THIS WELL IN THE CLASSROOM

HAVE GOOD IDEAS ABOUT
WHAT THEY WANT THEIR STUDENTS

TO GET OUT
OF A PARTICULAR ACTIVITY.

SO, IT'S REALLY USEFUL
FOR THE TEACHERS

TO CONSTRAIN, SOMEWHAT,
WHAT IT IS THAT THE KIDS CAN DO,

AND CONSTRAIN, SOMEWHAT,

WHAT IT IS
THE KIDS GET OUT OF A LESSON.

INSTEAD
OF THE KIDS GOING OUTSIDE

AND DIGGING ANYWHERE THEY WANT
AND FINDING ANYTHING THEY WANT

AND LEAVING IT COMPLETELY OPEN,

ERIEN WAS ABLE
TO FOCUS THE KIDS SOMEWHAT.

SURE, YOU CAN CHOOSE
THE LOCATION YOU WANT TO DIG IN,

BUT WHEN YOU GET THERE,

YOU'RE GOING TO HAVE TO TRY
TO DEVELOP A SOIL PROFILE.

I WANT YOU TO NOTICE THINGS LIKE
WATER AND COLOR OF SOIL

AND GRAINS
AND ORGANIC MATERIAL.

MAKE SURE YOU RECORD
AT WHAT LEVEL YOU HIT ROCK.

IT FEELS WEIRD IN THERE.

OH! THAT'S NOT VERY BIG.

DID WE GET
TO 12 INCHES YET?

A COUPLE MORE INCHES.

TEXTURE?

KIND OF, LIKE, DRY.

NO, NOT DRY.
THIS IS VERY WET.

THEY WERE ALL TOTALLY INVOLVED

IN WHAT THEY WERE DOING,
AND LOVING IT.

YOU COULD TELL
THEY JUST WANTED TO BE OUTSIDE

FOR AS LONG AS POSSIBLE.

KEPT ASKING, "HOW MANY MORE
MINUTES DO WE HAVE OUT HERE?"

WE ALMOST HIT --
IT AIN'T DEEP ENOUGH.

NO. WAIT. STOP.

DO YOU SEE THE BROWN
AND THEN THE LIGHT BROWN?

WE'RE GETTING THERE!

THIS IS SAND.

THAT'S MORE SAND.

DOES IT FEEL DIFFERENT
THAN THE TOP LAYER?

HOW DEEP WAS THIS
WHEN YOU FOUND IT?

EIGHTEEN INCHES SO FAR.

MAKE SURE YOU WRITE THAT
DOWN WHERE YOU FOUND IT.

THIS IS COOL.

SEE, THE SOIL'S
FEELING LIKE THAT.

FEEL IT NOW.

HOW DOES IT
FEEL DIFFERENT?

BECAUSE IT FEELS
MORE WATERY.

EVEN HERE?
NEAT. IT DOES.

YOU KNOW WHAT'S NEAT?

HOW DEEP WAS THAT
BEFORE YOU HIT WATER?

ABOUT 10 INCHES?

UM...13.

OVER THERE, WHERE IT'S
JUST AS MUCH OF AN AREA,

THEY HAD TO DIG
ABOUT 18 INCHES

BEFORE THEY HIT WATER.

LOOK AT THE DIFFERENCE
WITH THAT.

I'M ENVISIONING
THAT AT SOME POINT

DURING YOUR WETLANDS UNIT
YOU'LL HAVE A DISCUSSION.

WHAT MIGHT IT BE LIKE?

ACTIVE.
IT WILL BE ACTIVE.

THEY'LL ALL
BE DOING SOMETHING

OR LISTENING TO EACH OTHER
DO SOMETHING,

AND THINKING,
AND JUST HANDS-ON.

I SEE A LOT OF SCIENCE
WITH THE SOILS,

TAKING SOIL CORES,
AND THEN GOING THROUGH THEM

AND MAKING POSTERS
ABOUT WHAT THEY SEE,

AND INTEGRATING A LOT
OF DIFFERENT SUBJECTS,

NOT JUST SCIENCE,

SO THEY'D SEE THAT SCIENCE
ISN'T JUST SCIENCE,

BUT IT'S EVERYTHING.

A LOT OF TALKING,
BUT NOT JUST TALKING

ABOUT WHAT THEY'RE DOING
AFTER SCHOOL,

BUT TALKING ABOUT SCIENCE
AND ABOUT WHAT THEY'RE LEARNING.

ALL RIGHT, BOYS, YOU HAVE
THIS WHOLE PIECE OF PAPER.

DESCRIBE WHAT YOU FOUND
IN THE SOIL.

DRAW YOUR SOIL --
WHAT COLOR IT WAS,

WHERE YOU FOUND THESE WORMS,
AND ALL THE INTERESTING THINGS.

WHETHER YOU HIT WATER,
AT WHAT LEVEL,

HOW DEEP IT WAS
UNTIL YOU HIT WATER.

MAKE SURE YOUR NAME'S ON IT

BECAUSE YOU'RE GOING
TO USE THIS TOMORROW

TO EXPLAIN YOUR SOIL
TO THE CLASS.

NOW, LET'S START.

AT TWO INCHES,
WE FOUND WORMS.

WE FOUND ROCKS
DOWN HERE, TOO.

SO, MAKE IT DOWN
A LITTLE.

ALL RIGHT.

GOT TO MAKE IT BIGGER.

IT LOOKS GREAT, BOYS.

MY BIGGEST FEAR
ABOUT MIDDLE SCHOOL

IS PROBABLY THE MANAGEMENT --

NOT LETTING THE CLASS
GET OUT OF CONTROL,

BUT LETTING IT BE A CLASS
WHERE THEY'RE LEARNING.

THERE'S A LINE THERE WHERE
YOU HAVE TO KNOW WHEN TO STOP.

AND AS A BEGINNING TEACHER,
YOU CAN ALMOST MISS THE LINE,

AND THEN YOUR CLASS
IS OUT OF CONTROL.

THEN YOU SPEND YOUR WHOLE CLASS

TRYING TO GET THEM
BACK UNDER CONTROL.

AND NOTHING GOES THE WAY
YOU PLANNED IT.

SO, I'D RATHER LEARN QUICKLY
HOW TO KEEP THE CLASS IN CONTROL

AND HOW TO LEAD THE QUESTIONING
THE WAY I WANT IT TO GO

AND KEEP THE CLASS LEARNING,

AND NOT HAVE TO SPEND MY CLASSES
TRYING TO GET THE CLASS ON TASK.

THIS IS THE TOP,
THIS IS THE MIDDLE,

THIS IS, LIKE, THE MIDDLE,

AND THEN THE BOTTOM
AT THE VERY END.

AHA! THERE SHE IS!

LOOK AT THAT.

THIS WILL BE THE FIRST TIME

I HAVE LED A DISCUSSION
WITH THE CLASS.

Woman: HOW ARE YOU
FEELING ABOUT THAT?

OH, I CAN'T WAIT
TILL TOMORROW IS OVER.

NO, I'M EXCITED.

THEY'RE A GREAT CLASS,
AND THEY'RE VERY EXCITED

TO BE PARTICIPATING IN THIS.

THEY'LL BE WONDERFUL,
I'M SURE.

OKAY, STOP THE COLORING.

WE'RE GOING TO TURN AROUND

AND LISTEN TO EACH OTHER
EXPLAIN THE SOILS, OKAY?

ALL RIGHT, SO LET'S PUT
THESE AWAY FOR ONE SECOND.

WE'RE GETTING SO CLOSE,
I THINK.

ALL RIGHT, GIRLS AND BOYS,
LUCY IS READY TO EXPLAIN

WHAT SHE FOUND IN HER SOILS.

OKAY, THE WHOLE GROUP.

BOYS AT THE BACK TABLE.
PLEASE FACE FORWARD.

I'LL GET A BETTER ONE.

I KNOW THAT NOT
EVERYBODY IS FINISHED,

BUT FOR NOW, LET'S SEE
HOW MUCH WE'VE LEARNED

AND TRY TO COMPARE
OUR SOILS.

SO, PLEASE,
STOP THE COLORING.

ALL RIGHT, AND LET'S
LISTEN TO EACH OTHER.

IF YOU HAD A PICTURE
IN YOUR MIND

OF A GOOD CLASS DISCUSSION
GOING ON,

WHAT WOULD IT LOOK LIKE?

THEY WOULDN'T
JUST BE FACING ME,

THEY'D BE

FACING EVERYBODY.

WHEN ONE PERSON
RAISED THEIR HAND

OR ANSWERED A QUESTION,

THEY WOULD ALL LOOK
TO THAT PERSON.

IT WOULDN'T HAVE TO BE

STUDENT, TEACHER,
STUDENT, TEACHER.

IT WOULD BE
STUDENT, TEACHER,

STUDENT, STUDENT,
STUDENT, TEACHER.

I'D MORE LEAD IT,
AND THEY WOULD DISCUSS.

THIS IS THE HOLE WE DUG.

IT HAS A WATER HOLE
DOWN HERE.

AT SEVEN INCHES
WE FOUND WATER.

Erien: DID IT CHANGE COLORS
AS YOU DUG DEEPER?

THE FIRST TWO INCHES
IT WAS LIGHT BROWN.

LIKE A RUSTY COLOR.

AND THEN LOWER
IT GOT DARK.

DARK GOES IN THE WATER.

ASKING QUESTIONS IS GREAT.

I LOVE TO DO IT,
AND I WANT TO DO IT,

BUT IT CAN BE HARD, TOO,

KNOWING WHEN TO STOP
ASKING THE QUESTIONS.

WHEN THEY ALL
HAVE THEIR HANDS RAISED,

YOU CAN'T POSSIBLY
GO THROUGH THEM ALL

IN ONE CLASS PERIOD

AND THEN LEARN ANYTHING
AT THE SAME TIME

BESIDES ASKING QUESTIONS.

WHEN TO LIMIT THE QUESTIONS,
AND WHEN TO ASK MORE --

THAT'S THE HARD PART.

YOU DON'T WANT TO HURT
ANY CHILD'S FEELINGS,

AND YOU WANT THEM
TO STAY EXCITED.

BUT, THEN AGAIN,
YOU HAVE TO KEEP MOVING ON.

WHAT I WANT TO PROPOSE TO YOU
IS SOMETHING

THAT MIGHT BE CALLED
ALTERNATIVES TO QUESTIONS.

INSTEAD OF JUST USING
QUESTIONS,

THAT THERE MIGHT BE SOME OTHER
THINGS YOU COULD DO AND SAY

THAT WOULD GET KIDS
TO THINK AND CONTRIBUTE

AND BE A PART
OF A DISCUSSION.

Narrator:
ERIEN AND TOM EXCHANGED IDEAS

ABOUT DESIGNING AND MANAGING
STUDENT-CENTERED DISCUSSIONS.

OKAY, MARISSA,
WHERE DID YOU DIG?

CAN YOU BEGIN BY TELLING US
WHERE YOU DUG?

YOU KNOW WHERE
THE PARKING LOT IS?

WELL, AROUND THERE.

WE DIDN'T GO INTO THE WOODS.
WE JUST WENT IN THE MIDDLE.

IT WAS, LIKE, ALL GRASS.

WE PUT WHERE IT WAS,
LIKE, NOT WET.

IT WAS DRY.

AND THEN IT WENT
WETTER AND WETTER

AND WETTER AND WETTER.

THEN WE FOUND THIS RED THING,
AND WE COULDN'T GET IT OUT.

WE TRIED TO WIGGLE IT,
AND IT WOULDN'T COME UP.

A LOT OF ROOTS WERE THERE.

THEY WERE VERY THICK,

AND WE COULDN'T GET
THROUGH THEM.

THERE WAS NO WAY
WE COULD GET THROUGH THEM.

WE FOUND A LOT OF WORMS
AND BUGS AND WHITE THINGS.

MARISSA, WHAT DO YOU THINK
THAT RED THING *COULD* HAVE BEEN?

IT COULD
HAVE BEEN ANYTHING.

WHAT WAS IT?

IT WAS LIKE
A METAL SOMETHING.

Erien: DO YOU THINK IT
WAS SUPPOSED TO BE THERE?

OR MAYBE A HUMAN HAD PUT
IT THERE AT ONE TIME?

A HUMAN PUT IT THERE

BECAUSE IT
WAS LIKE A TRIANGLE.

SO, IT SHOULD NOT
HAVE BEEN THERE?

NO, BECAUSE WE FOUND
ANOTHER BRICK,

BUT WE DIDN'T DIG IT UP.

IT'S HARD TO PREDICT WHAT'S
GOING TO HAPPEN IN A DISCUSSION.

KIDS COULD BRING UP TOPICS
THAT YOU'RE UNCOMFORTABLE WITH.

KIDS COULD GO OFF IN A DIRECTION

THAT YOU WEREN'T PLANNING
ON THEM GOING.

KIDS COULD JUST
TOTALLY GET OUT OF CONTROL

BECAUSE IT'S A
LOOSELY STRUCTURED ENVIRONMENT.

YET THE DISCUSSIONS
ARE REALLY VALUABLE

BECAUSE THEY PROVIDE A SPACE

FOR KIDS
TO EXPLORE SOME IDEAS IN DEPTH,

TEST THEIR KNOWLEDGE
AND UNDERSTANDINGS,

LAY IT OUT FOR OTHERS
TO BE THINKING ABOUT, TOO.

JASON?

DID YOU EVER HIT
ANY MOIST SPOTS?

ONE PLACE, WASN'T IT
WICKED SOUPY?

IT WAS FILLING UP
WITH WATER.

THERE WASN'T TOO MANY
BUGS DOWN THERE, THOUGH.

I JUST WANT TO MAKE SURE

THEY HAVE LEARNED
A FEW KEY THINGS,

LIKE WHY WETLANDS MIGHT BE DARK.

WERE THEY SURPRISED THAT
THEIR HOLE FILLED UP WITH WATER?

I WANT TO BRING
THESE POINTS OUT,

AND IF THEY DON'T COME OUT
IN CONVERSATION,

THEN I'LL ASK IT IN A QUESTION.

DID THEIR SOIL
CHANGE COLORS?

Erien: EXCELLENT
QUESTION, JONATHAN.

IT WENT TO LIGHT
TO DARKER

AND DARKER AND DARKER
AND DARKER.

SO IT WENT FROM LIGHT
TO DARKER TO DARKER?

YEAH, EVERY TIME WE'D DIG
DEEPER, IT WOULD BE DARKER.

HOW MANY PEOPLE'S SOIL

WENT FROM LIGHTER
TO DARKER?

THERE WERE A FEW TIMES
THROUGHOUT THE DISCUSSION

THAT I CALLED FOR A VOTE
TO BRING BACK SOME ATTENTION

FOR SOME STUDENTS
THAT WERE WANDERING.

NOT ALL CHILDREN
WANT TO SIT THERE AND LISTEN.

YOU NEED SOME WAY
TO GET THEM INVOLVED.

THEY COULD VOTE,
AND THAT WOULD AT LEAST

ATTRACT THEIR ATTENTION
FOR THOSE FEW MINUTES.

AND THEY HAD TO KNOW
WHAT THEY WERE VOTING ON

TO BE EVEN ABLE TO VOTE.

ALSO, MORE CHILDREN
COULD PARTICIPATE.

I NOTICED A LOT OF THEM
HAD THEIR HANDS RAISED,

AND I KNOW
THAT WE NEEDED TO MOVE ON

IN ORDER TO GET
A FEW MORE PRESENTATIONS.

THAT WAS ONE WAY OF,
HOPEFULLY,

GETTING
A FEW QUESTIONS ANSWERED.

NOW LOOK AT THE WAY
JONATHAN COLORED HIS POSTER.

THAT'S DIFFERENT,
ISN'T IT?

IT'S PRETTY NEAT.

JONATHAN, EXPLAIN TO US
FIRST HOW YOU COLORED IT.

FIRST, WE JUST TOOK
THE CLAY THAT WE FOUND,

AND WE RUBBED IT
AGAINST THE PAPER.

WE DARKENED IT
WITH SOME MUD

THAT WE GOT
DEEPER IN THE HOLE.

SO, IT WAS A LOT
LIKE JONATHAN'S.

DO YOU HAVE
YOUR POSTER AGAIN?

YOU WANT TO HOLD IT UP
NEXT TO THEIRS

SO WE CAN COMPARE THEM?

AT ONE POINT,
I BROUGHT ANOTHER GROUP UP

TO STAND NEXT TO THE GROUP
THAT WAS SPEAKING

BECAUSE THEY BOTH DUG
IN THE SAME AREA.

I WAS GOING TO, HOPEFULLY,

AS THE DISCUSSIONS WENT ON,
BRING UP MORE AND MORE.

Dana:
THE SOIL PROFILES ACTIVITY

WAS A COMMON EXPERIENCE
THAT ALL THE KIDS SHARED.

I THINK TO HAVE
A REALLY GOOD DISCUSSION

YOU NEED TO HAVE A COMMON
EXPERIENCE FOR THE STUDENTS.

THE KIDS
HAVE SHARED SOMETHING IN COMMON,

AND WHEN STUDENTS
ARE RAISING ISSUES

OR DISCUSSING SOMETHING

THEY FOUND

AS PART OF THAT ACTIVITY,

OTHER KIDS
CAN EASILY RELATE TO IT

AND CAN EITHER
EXPAND ON WHAT WAS SAID

OR ASK SOME REAL GOOD,
PROBING, MEANINGFUL QUESTIONS.

AT WHAT POINT
DID YOU FIND THE CLAY?

OKAY, THE CLAY WAS MOSTLY
IN THIS AREA.

RIGHT WHERE
THE WATER WAS, TOO.

IT WAS
ALL AROUND THE WATER.

IT WAS MOIST CLAY.

SO ALL YOU DO -- FOLD IT,
MAKE IT INTO BALLS.

MARISSA?

YOU SAID THAT THE WATER

WAS COMING IN
FROM THE SIDES.

DID YOU CONTINUE DIGGING
ON THE SIDE TO FIND MORE?

WE CONTINUED DIGGING
DOWN IN OUR HOLE.

THIS ISN'T THE WHOLE GRAPH.
WE WENT FARTHER DOWN.

WE WENT DOWN
AT LEAST 24 INCHES,

AND NO SIGNS OF WATER.

THERE WAS ONLY WATER
ON THE SIDES IN ONE SPOT.

THEY DIDN'T NEED A MODERATOR.

THEY COULD JUST HAVE
A DISCUSSION BY THEMSELVES.

THAT'S A BIG GOAL,

NOT JUST FOR SCIENCE,
BUT AS PART OF GROWING UP,

TO BE ABLE
TO HOLD A CONVERSATION.

AND THEY RAISED THEIR HANDS.

AND THE ONE SPEAKING COULD CALL
ON THE NEXT PEOPLE TO SPEAK.

I THOUGHT THAT WAS GREAT.

DID YOU DIG IN THE AREA
WHERE THERE WAS GRASS,

OR DID YOU DIG JUST ON MUD?

IT WAS GRASS.

ANOTHER WAY
OF DOING THIS DISCUSSION

COULD HAVE ALSO BEEN IN GROUPS,

HAD THEM IN TWO GROUPS,
EXPLAIN THEIR POSTERS,

MAYBE HAD EVERYBODY THAT
WAS UNDER THE BRIDGE TALK FIRST,

AND THEN EVERYBODY
THAT WAS IN THE FIELD TALK,

AND THEN EVERYBODY
BY THE STREAM.

AND THEN TOGETHER
COULD COME TO AGREEMENTS.

JUST HAVE THREE BIG GROUPS
THAT COULD HAVE GOT UP

AND SPOKEN
ABOUT WHAT THEY LEARNED.

IT WOULD HAVE BROKE DOWN IN
THE NUMBER OF GROUPS SPEAKING,

AND MORE OF THEM
COULD HAVE TALKED

BECAUSE THEY COULD HAVE TALKED
AMONG EACH OTHER.

ALL RIGHT, LET'S EVERYBODY
STOP WHAT THEY'RE DOING.

AND, PLEASE, LET MOSES EXPLAIN
WHAT HIS SOIL LOOKED LIKE.

THE CLAY IS BEING
PASSED AROUND.

YOU CAN FEEL IT AND SMELL IT
WHEN IT GOES AROUND.

BUT LET'S KEEP THE MOUTHS
QUIET AND LISTEN TO MOSES.

OKAY.

OKAY, WHEN WE WERE DIGGING,
IT WAS KIND OF WET AND MUDDY.

AND WE PICKED UP SOME MUD.

WE FOUND A COUPLE WORMS
AND SPIDERS

WHEN WE WERE DIGGING
NEAR THE BRIDGE.

SO, IT'S PRETTY COOL.

DID THE COLORS CHANGE AT ALL
WHEN YOU WERE DIGGING?

YEAH, IT STARTED TO TURN
BROWN, THEN REAL BLACK.

LIKE, REAL DARK BLACK.

UNFORTUNATELY WE
HAVE TO WIND UP TODAY.

WE'RE GOING TO FINISH THIS
TOMORROW, I PROMISE.

I'M SORRY, GUYS.
WE JUST RAN OUT OF TIME.

Woman over intercom:
STUDENTS AND TEACHERS,
PLEASE HEAR THIS ANNOUNCEMENT.

TOMORROW THERE WILL BE
A PENCIL SALE.

ALL RIGHT, EYES AND EARS
UP HERE.

EYES AND EARS UP HERE.

EVERYBODY, SETTLE DOWN.

EVERYTHING SHOULD BE
OFF THE DESKS.

ALL RIGHT, BOYS AND GIRLS,

THIS IS WHAT
WE'RE GOING TO DO TODAY.

YOU JUST HAVE TO REALIZE

THAT THEY'RE GOING TO TALK
AND THEY'RE GOING TO BE KIDS.

YOU CAN'T LET THAT UPSET YOU.

BECAUSE IF YOU TRY TO CHANGE
THEM FROM WHO THEY ARE,

IT'S A WALL.

SO YOU TRY TO WORK WITH THEM

TO HELP THEM LEARN
AS MUCH AS THEY CAN,

AND NOT FIGHT AGAINST THEM.

TODAY, IN YOUR GROUPS,

YOU WILL BE
A PLANNING COMMITTEE.

YOU'LL HAVE A PROBLEM
ON THIS WORK SHEET HERE.

THIS IS THE PIECE OF LAND.
THIS IS IN METHUEN.

THEY WANT TO BUILD
AN OLD-AGE HOME

ON THIS PIECE OF LAND.

YOU CAN SEE HERE, THERE'S
A HIGHWAY, THERE'S A ROAD,

THERE'S A STREAM, AND DOWN HERE
IT'S ALL WETLANDS.

TOGETHER WITH YOUR GROUP,

YOU HAVE TO DETERMINE

HOW YOU WOULD BUILD
AND OLD-AGE HOME.

READ THIS CAREFULLY.

YOU WILL EACH BE GIVEN
A ROLE TO PLAY.

ONE OF YOU WILL BE
AN EPA OFFICIAL,

ONE OF YOU WILL BE
THE BUSINESSMAN,

ONE OF YOU WILL BE
THE BUILDER,

AND ONE OF YOU WILL BE
THE OWNER OF THE LAND.

TOGETHER YOU HAVE TO WORK
AND DEVELOP A PLAN.

ALL RIGHT, YOU HAVE
A HALF-HOUR.

Scannel: SHE JUST HAS
THAT NICE WAY ABOUT HER.

SHE KNOWS HOW TO TALK
TO THE CHILDREN,

NOT AT THEM OR NOT DOWN TO THEM.

SO THEY KEYED IN TO HER.

AND THE LESSONS
REALLY WENT WELL.

AND EACH LESSON GOT
BETTER AND BETTER FOR THEM.

AND IT WAS GOOD TO SEE THE KIDS

START TO UTILIZE THE WETLANDS
SURROUNDING THE SCHOOL

BECAUSE IT'S MORE OR LESS
LIKE A LIVING LAB

THAT WE HAVE HERE ALL THE TIME.

NO DESTROYING WETLANDS,

BECAUSE THEN WE'RE GOING
TO HAVE TO PAY FOR THEM.

AND I'M MONEY-HUNGRY.

HERE IS THE PARKING LOT.

WHAT ARE YOU DOING?

THAT'S ONE PART
OF THE ROOF RIGHT THERE.

THEN THE OTHER PART'S
GOING TO BE RIGHT THERE.

YOU GO OVER THE WETLANDS,
YOU GOT TO REBUILD IT

SOMEWHERE ELSE,
LIKE PLANT IT.

AND IF YOU WENT AROUND IT,
THEN YOU WOULDN'T HAVE TO SPEND
THE MONEY TO BUILD IT.

BOYS AND GIRLS, THIS
IS CALLED A TOWN MEETING.

A LOT OF TOWNS
ACTUALLY DO THIS.

YOU HAVE BEEN INVITED
TO THIS TOWN MEETING

BECAUSE EACH OF YOU
HAS DEVELOPED

YOUR OWN PLAN, A BLUEPRINT,
OF HOW YOU WANT TO BUILD
THIS OLD-AGE HOME.

OUT THERE, I KNOW I HAVE
LOTS OF EPA OFFICIALS,

I HAVE LOTS OF BUSINESSMEN,
I HAVE LOTS OF BUILDERS.

KEEP THOSE ROLES.

WHEN THE OTHER GROUPS
GET UP,

NO NAME-CALLING,
NO BEING MEAN.

WE CAN DISCUSS EACH OTHER'S
PLANS NICELY, OKAY?

IF YOU'RE A BIRD-LOVER,

AND YOU GET UP AND SEE
SOMEBODY COME UP WITH A PLAN,

AND YOU THINK THAT THEIR PLAN
IS GOING TO KILL ALL THE BIRDS,

SPEAK UP.

NOW, YOU ARE ADULTS.
YOU ALL ARE PROFESSIONAL, OKAY?

KEEP THOSE PARTS.

ADULTS DON'T SPEAK OUT.
THEY LISTEN TO EACH OTHER.

AND IF YOU CAN'T BE QUIET,

YOU WILL BE ESCORTED
OUT OF THE TOWN MEETING.

OKAY? ALL RIGHT.

FIRST GROUP, FRONT ROW,
COME ON UP,

LISTEN TO EACH OTHER.

WITH THIS GROUP, YOU NEED

TO MAKE DISCUSSIONS INTERESTING.

AS YOU CAN TELL,
THEY'RE TALKATIVE.

SO, BY PUTTING THEM IN ROWS,
IN A TOWN MEETING,

I THOUGHT MAYBE THAT WOULD KEEP
THEIR ATTENTION A LITTLE MORE

THAN JUST HAVING THEM SIT
AT THEIR SEATS.

IT ALSO GOT THEM AWAY
FROM THE TABLES

AND THEIR PENCILS AND CRAYONS.

WE BUILT
AWAY FROM THE WETLANDS.

AND TWICE A WEEK,

WE BRING ALL THE PEOPLE
WHO WANTED TO GO

DOWN FOR A TOUR
AROUND THE WETLANDS.

SO WE WOULDN'T DISRUPT
THE WILDLIFE AND WETLANDS.

OKAY, THIS COULD BE
IN YOUR TOWN.

ANYBODY HERE HAVE ANYTHING
YOU'D LIKE TO TALK ABOUT?

WOULDN'T THE WATER
FLOOD INTO THE CELLAR?

OF THE HOME.

ONE OF THE IMPORTANT ELEMENTS

IN ERIEN'S
CLASSROOM DISCUSSION TECHNIQUE

IS BALANCING THE NEED FOR KIDS
TO BE INQUIRERS

AND TO FREELY EXPLORE
WHAT THEY WANT TO EXPLORE,

AND BALANCING THAT
WITH HER NEEDS AS A TEACHER

TO ACCOMPLISH CERTAIN GOALS
IN THE CLASSROOM.

IF THE OIL SPILLED
INTO THE WETLANDS,

THAT WOULDN'T BE
OUR PROBLEM.

THEY'D HAVE TO CLEAN IT UP,
NOT US.

[ALL ASKING QUESTIONS]

Erien: I FOUND IT'S TOUGH
TO GET USED TO PAYING ATTENTION

TO WHAT THE CHILDREN SPEAKING

ARE SAYING,

AND ALSO MONITORING THE BEHAVIOR
OF THE OTHER STUDENTS.

YOU WANT TO LISTEN
AND BE ABLE TO ASK THE QUESTIONS

AND BE ABLE TO PARTICIPATE
IN WHAT THEY'RE SAYING.

BUT AT THE SAME TIME,

YOU WANT THE OTHER STUDENTS
TO AT LEAST BE QUIET

AND RESPECTFUL
OF THOSE SPEAKING.

BUT EVERY TIME YOU TURN
TO SPEAK TO SOMEBODY ELSE,

YOU MISS WHAT THEY'RE SAYING.

YOU HAVE TO BE
IN TWO PLACES AT ONCE

SO THAT YOU WON'T BE HURTING
THOSE STUDENTS WHO ARE SPEAKING.

THIS IS THE OLD-AGE HOUSE
THAT WE BUILT.

THERE WAS A GRAVEL DRIVEWAY,

AND THE PARKING LOT
IS MADE OUT OF SAND.

AND THEY HAVE A GARAGE.

AND WE HAVE BUILT
FAR AWAY FROM THE WETLANDS.

SAY THE PEOPLE LIKE
TO WALK IN THE WETLANDS.

HOW FAR AWAY FROM IT
IS THAT?

IT ISN'T THAT LONG

BECAUSE THERE IS A LITTLE
PATH SOMEWHERE OVER THERE.

THEY WERE LISTENING
TO EACH OTHER.

AND ESPECIALLY THE FIRST ROW,
THE GIRLS THERE

REALLY WERE TRYING TO COMPARE
THE DIFFERENT GROUPS.

WHY DID YOU DECIDE TO USE
ELECTRIC HEATING?

BECAUSE THE SMOKE
WOULD POLLUTE THE AIR.

AND THEN ALL THE BIRDS...

YOU CAN USE THE STUDENTS
TO HELP LEAD THE DISCUSSIONS.

I KNEW THAT A FEW STUDENTS

WOULD PROBABLY HAVE
GOOD COMMENTS

THAT WOULD PROBABLY HELP
THE REST OF THE CLASS THINK,

AND THEN MOVE ALONG
THE DISCUSSION,

BRING IN NEW POINTS.

I KNOW YOU SHOULDN'T ALWAYS
CALL ON THE SAME PEOPLE.

BUT THEY BRING UP A POINT,

AND THEN EVERYBODY ELSE
THINKS ABOUT IT.

WE BUILT A HUNDRED YARDS
AWAY FROM THE WETLANDS.

WHY DID YOU CHOOSE
A HUNDRED YARDS?

BECAUSE THIS EPA OFFICIAL
SAID TO.

Scannel: I THINK THE CHILDREN
SHOULD HAVE HAD THE QUESTIONS

SET UP AHEAD OF TIME,

THAT THEY COULD HAVE DISCUSSED
AND RESEARCHED

MAYBE A FEW DAYS PREVIOUS,
TO REALLY GET INTO IT.

AND THEN THEY'D HAVE
A BETTER IDEA

AS TO HOW TO ANSWER
THE QUESTIONS.

BECAUSE IT WAS
A LITTLE BIT HODGEPODGE.

THEY DIDN'T REALLY KNOW
WHAT KIND OF QUESTIONS

THE OTHER KIDS
WERE GOING TO ASK.

AND KIDS TEND TO BE SILLY.

AND SOME OF THE QUESTIONS
WERE SILLY.

SO, I THINK
IT WOULD HAVE BEEN BETTER

IF IT WERE MORE TASK-ORIENTED,
LIKE "THESE ARE THE QUESTIONS.

"MAYBE OUT OF THESE 10,
5 WILL BE ASKED.

"SO RESEARCH ALL OF THEM

BECAUSE YOU'RE NOT QUITE SURE
WHICH ONES IT WILL BE."

AND I THINK
THAT WOULD HAVE BROUGHT THEM IN

TO BE MORE FOCUSED
ON THAT LESSON.

WE HAD A QUESTION
BACK THERE FROM ANDREW.

ANDREW, WHY DON'T YOU
REPEAT THAT?

HOW DO YOU BUILD
A FOUNDATION

IF IT'S ON SOLID LAND?

YOU DIG IT.

BUT HOW COME
THERE'S NO BASEMENT?

THERE *IS* A BASEMENT.

YOU JUST SAID THERE WASN'T.

IT'S NOT ON SOLID GROUND.

WE DID THE FOUNDATION,

AND THERE'S A BASEMENT,
OKAY?

ALL RIGHT, THESE QUESTIONS

ARE GETTING REALLY HARD
FOR HIM TO ANSWER...

NO, NO,
I LIKE HARD QUESTIONS.

THIS IS THE LAST QUESTION.

CLASSROOM MANAGEMENT
AND CLASSROOM DISCUSSIONS

ARE NOT TWO SEPARATE THINGS.

REALLY, MANAGING A GOOD
DISCUSSION IS IMPLEMENTING

THE GOOD CLASSROOM MANAGEMENT
STRATEGIES

THAT YOU WANT TO PRACTICE
IN YOUR CLASSROOM.

ALL RIGHT, EVERYBODY,
LISTEN TO THIS GROUP.

IT HAS A FENCE OVER HERE
TO PROTECT THE WETLANDS.

AND HERE'S A DIRT ROAD...

Erien: AFTER DOING
THE TWO PRACTICUMS,

ELEMENTARY AND MIDDLE,
I LOVE ELEMENTARY.

BUT I REALLY LIKE
THE MIDDLE SCHOOL.

I LIKE
THE INDEPENDENCE THEY HAVE

AND THE FREEDOM
YOU CAN GIVE THEM.

AND THEIR PERSONALITIES
ARE JUST ADORABLE.

I THINK THEY REALLY NEED
THE TEACHERS

THAT REALLY LIKE KIDS,
REALLY WANT TO BE AROUND KIDS.

BECAUSE IT SHOWS,
AND THEY KNOW IT.

AND THEY'RE A TOUGH AGE,

AND THEY NEED PEOPLE
THAT CARE ABOUT THEM.

AND I THINK I CAN MAKE
THE MOST BENEFITS

AND HELP THEM THE MOST.

SO I'M LOOKING
FOR A MIDDLE SCHOOL JOB.

OKAY, YOU CAN GET
YOU SNACKS.

CHAIRS BACK,
AND THEN GET YOUR SNACKS.

-- CAPTIONS BY VITAC --
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