

Captions

(T10D)

Technology to Support Visually-Impaired Deaf

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JUNE 26, T10D. 1

Technology to Support Visually-Impaired Deaf & Hard-of-Hearing Students

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National Technical Institute for the Deaf

Presented at the Instructional Technology and Education of the Deaf Symposium, held at the National Technical Institute for the Deaf, Rochester, NY; June 25-29, 2001. <http://www.rit.edu/~techsym>

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>> I HAVE SOME HAND-OUT THINGS, SO IF WE'RE GOING TO BE A SMALL GROUP, IT MIGHT BE BETTER TO MOVE DOWN, BECAUSE I'M GOING

TO BE GIVING YOU SOME GLASSES AND THINGS.

>> AUDIENCE: MY NAME IS GREG, AND I'M FROM CLEARWATER, FLORIDA. I'M AN INSTRUCTIONAL TECHNOLOGIST. I'M ABSOLUTELY NEW

TO DEAF THINGS.

>> JOSARA WALLBER: OH, BOY.

>> AUDIENCE: I THOUGHT I WOULD COME HERE TO LEARN ABOUT

TECHNOLOGY, AND I'M LEARNING MORE ABOUT DEAF CULTURE,
BECAUSE

I'M CLUELESS.

>> JOSARA WALLBER: PUT THAT DOWN IN YOUR EVALUATION.

>> AUDIENCE: I'M FROM JAPAN.

>> JOSARA WALLBER: WELCOME, WELCOME.

>> AUDIENCE: THANK YOU.

>> JOSARA WALLBER: HI, BILL. WHERE ARE YOU FROM?

>> AUDIENCE: SAINT FRANCIS UNIVERSITY IN PENNSYLVANIA.

MY BACKGROUND IS AN OCCUPATIONAL THERAPIST. I RECENTLY
WENT

INTO RESEARCH. AND I ALSO WORK WITH SOME OF THE EQUIPMENT.

>> JOSARA WALLBER: WELCOME.

I WOULD LIKE TO START BECAUSE I KNOW YOU HAVE PLACES TO
GO.

>> MODERATOR: HELLO, EVERYONE. MY NAME IS PETER

SCHLEGEL. I WANT TO INTRODUCE JOSARA WALLBER AS THE
PRESENTER

TODAY. SHE WILL BE PRESENTING ON THE TOPIC OF TECHNOLOGY

SUPPORTS FOR THE VISUALLY IMPAIRED FOR THE DEAF AND

HARD-OF-HEARING STUDENTS. SHE WORKS HERE AT N.T.I.D. IN THE
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HEARING AND EYE CLINIC. AND OUR INTERPRETER IS LATASHA HILL.

AND WE'RE READY.

>> JOSARA WALLBER: I WANT TO MAKE SURE EVERYBODY HAS A

HANDOUT. YOU MAY WANT TO TAKE NOTES. I DID NOT GIVE YOU A COPY

OF EVERY SLIDE. I GAVE YOU A COPY OF THE SLIDES I THINK YOU NEEDED TO HAVE. IF YOU WANT TO JOT A NOTE ON THEM, FEEL FREE.

I WANT TO START OUT WITH BASIC ANATOMY SO WE CAN ALL UNDERSTAND WHY THE STUDENTS SEE WHAT THEY DO AND WHY THE TECHNOLOGY HELPS THEM.

THE FIRST THING WHEN YOU LOOK AT THE EYE, AT THE CROSS-SECTION, THE FRONT OF THE EYE IS CALLED THE CORNEA. IT IS

A TRANSPARENT SURFACE. BEHIND THAT YOU HAVE THE IRIS, WHICH IS

THE COLORED PART OF YOUR EYE, WHICH ADJUSTS THE AMOUNT OF LIGHT

WHICH COMES INTO YOUR EYE. THEN THERE IS THE LENS, AND THE LENS

IS IN A RELAXED STATE, IS A SPHERICAL SHAPE, AND WHEN YOU WANT

TO FOCUS ON SOMETHING, THERE ARE MUSCLES IN YOUR EYE THAT CONTRACT AND FLATTEN IT SO THAT YOU CAN SEE THINGS CLOSER UP

RATHER THAN FAR AWAY.

THEN WE HAVE THE RETINA, WHICH IS THE PHOTSENSITIVE

NERVE ENDINGS THAT ARE CONNECTED TO THE BRAIN. NOW, FROM HIGH

SCHOOL BIOLOGY REMEMBER THAT THE RETINA HAS TWO KINDS OF CELLS,

RODS AND CONES. AND THAT BECOMES IMPORTANT LATER WHEN WE TALK

ABOUT TYPES OF VISION.

THE RODS AND CONES ARE NOT EVENLY DISTRIBUTED ON THE

RETINA. THE CONES ARE MAINLY CONCENTRATED IN THE CENTER OF THE

EYE IN THE AREA WE CALLED THE MACULA. YOU'VE ALL HEARD OF 3

MACULA DEGENERATION. THE RODS ARE PRIMARILY IN THE PERIPHERY,

SO KEEP THAT PICTURE, AS WE TALK ABOUT HOW PEOPLE SEE.

WHEN YOU LOOK AT SOMETHING, WE CALL IT REFRACTION.

REFRACTION SIMPLY MEANS BENDING OF LIGHT. WHEN YOU LOOK AT AN

IMAGE, THAT LIGHT TRAVELS THROUGH THE EYE AND IS BENT BY THOSE

STRUCTURES, FIRST THE CORNEA, THEN THE LENS AND THEN FOCUSES ON

THE RETINA. IN A PERFECT EYE, THIS IS WHAT YOU WOULD SEE, THE

IMAGES AND FOCUS RIGHT ON THE RETINA. THERE ARE FOUR REASONS

WHY PEOPLE DON'T SEE WELL AND WEAR GLASSES, AND THAT'S CALLED

REFRACTIVE ERROR. AND THERE ARE FOUR DIFFERENT TYPES. LET'S

TALK ABOUT EACH ONE INDIVIDUALLY, QUICKLY.

NUMBER ONE IS MYOPIA. THAT'S THE MOST COMMON. THAT'S

NEARSIGHTED. THAT'S ME, THAT'S YOU, THAT GUY BACK THERE, YOU ALL HAVE NEARSIGHTEDNESS. WHEN YOU LOOK AT AN OBJECT, YOUR

CORNEA AND LENSES BEND THE LIGHT TOO SOON. IT DOESN'T GET BACK

WHERE IT NEEDS TO BE. AND WE CORRECT THAT WITH GLASSES.

THE SECOND MOST COMMON IS HYPEROPIA, AND THAT'S

FARSIGHTED. THEIRS, THE LIGHT COMES AND FOCUSES SOMEWHERE

BEHIND THE EYE. AND, AGAIN, WITH GLASSES, WE CAN PULL THAT

IMAGE FORWARD SO IT IS IN FOCUS ON THE RETINA.

THE THIRD KIND IS WHAT WE CALL ASTIGMATISM, JUST LIKE IT

SOUNDS. THAT'S WHERE THE CORNEA, INSTEAD OF BEING A SMOOTH,

SPHERICAL SURFACE, IT ACTUALLY IS IRREGULAR, SO YOU HAVE MORE

THAN ONE IMAGE COMING TO THE BACK OF THE EYE, AND CLEARLY IT'S

NOT CLEAR. WE CORRECT THAT WITH GLASSES, ALSO.

THE LAST IS PRESBYOPIA, OLD EYES. WHAT HAPPENS AS YOU 4

GET TO BE ABOUT 40, YOUR LENS STARTS TO GET STIFF, LIKE ALL THE

OTHER PARTS OF YOUR BODY, AND WHEN YOU TRY TO FLATTEN THAT LENS

TO FOCUS ON SOMETHING CLOSE, IT WON'T FLATTEN ANYMORE. AND

AGAIN, WE CAN CORRECT THAT WITH GLASSES.

SO THOSE ARE VISION PROBLEMS THAT WE CAN CORRECT.

NOW LET'S TALK ABOUT DIFFERENT TYPES OF VISION. THE FIRST ONE, WHICH WE'RE ALL FAMILIAR WITH, IS VISUAL ACUITY. VISUAL ACUITY IS HOW CLEAR THINGS ARE. WHEN YOU GO TO THE EYE DOCTOR AND YOU LOOK AT THAT CHART, HE'S TESTING YOUR ABILITY TO SEE THINGS CLEARLY, AND YOU'RE USING YOUR CONES TO DO THAT. WHEN YOU WANT TO SEE CLEARLY, YOU PUT THAT OBJECT ON THE CENTER OF YOUR EYE, ON THAT AREA OF THE CONES, WHICH IS CALLED THE MACULAR. IF YOU'RE LOOKING AT ME RIGHT NOW, I'M CLEAR. YOU CAN STILL SEE THOSE PEOPLE ON THE SIDE OF YOU, BUT THEY AREN'T CLEAR. YOU HAVE TO TURN AND PUT THEM ON YOUR MACULAR TO MAKE THEM CLEAR. SO THAT'S VISUAL ACUITY. COLOR VISION IS ALSO DONE BY THE CONES. NOW, THE OTHER THING ABOUT CONES IS THEY ONLY WORK IN GOOD LIGHT, SO YOU HAVE TO HAVE LIGHT TO SEE COLOR. COLOR IS TESTED WITH THESE PLATES. YOU'VE ALL SEEN THEM BEFORE, THE HIDDEN NUMBER PLATES. THE CONES ONLY WORK IN BRIGHT LIGHT, WHICH IS WHY AT NIGHT THINGS LOOK MOSTLY BLACK AND WHITE. YOU HAVE TO HAVE GOOD LIGHT TO SEE COLOR. THE THIRD TYPE OF VISION IS WHAT WE CALL STEREOSCOPIC, OR

3-D. AND AGAIN, WE HAVE SPECIAL TESTS TO TEST THAT. THREE-DIMENSIONAL VISION DEPENDS ON THE TWO EYES BEING EQUALLY 5 FUNCTIONAL, THAT THEY BOTH CAN SEE THE SAME THING AT THE SAME TIME. AND IT IS YOUR BRAIN THAT -- YOUR TWO EYES ACTUALLY SEE DIFFERENT THINGS, AND WHERE THEY'RE OVERLAPPED AND DIFFERENT IS WHAT -- THAT OVERLAP, THEY'RE THE SAME, AND ON THE OUTSIDE THEY'RE DIFFERENT -- YOUR BRAIN INTERPRETS THAT AS DEPTH. SO YOU HAVE TO HAVE BOTH EYES FUNCTIONING IN ORDER TO SEE DEPTH.

THE NEXT TYPE OF VISION WE HAVE IS WHAT WE CALL LOW-LIGHT VISION, OR VISION IN DIM LIGHT. THAT IS DONE BY THE RODS. THE RODS ARE WHAT SEE AT NIGHT. THEY'RE VERY SENSITIVE TO LIGHT, BUT THEY DON'T SEE COLOR. THEY ARE ALSO VERY SENSITIVE TO MOVEMENT, AND THE REASON THEY'RE ON YOUR PERIPHERY IS BECAUSE

WHEN WE LIVED IN THE JUNGLE, YOU NEEDED TO SEE THAT TIGER MOVING

OVER HERE AND GET OUT OF THE WAY. SO YOU DIDN'T NEED TO SEE IT

CLEARLY, BUT YOU NEEDED TO SEE THAT MOVEMENT. THEY'RE VERY SENSITIVE TO MOVEMENT AND DIM LIGHT.

AND OUR LAST TYPE OF VISION IS THE PERIPHERAL VISION, AND THAT, AGAIN, IS ROD-SUPPORTED VISION. AND WE TEST IT WITH THESE

SPECIAL MACHINES WHERE YOU PUT YOUR HEAD IN AND WE CAN MEASURE

HOW FAR OUT YOU CAN SEE AND HOW DIM YOU CAN SEE OUT THERE.

SO WHEN WE HAVE VISION PROBLEMS IN THE GENERAL POPULATION OF SCHOOL-AGED CHILDREN, IT'S REPORTED AT 25% HAVE A VISION PROBLEM. IN THE DEAF AND HARD-OF-HEARING SCHOOL AGE, IT'S BEEN

REPORTED AT 50%.

AT N.T.I.D., WE'VE BEEN STUDYING IT FOR ABOUT 18 YEARS,

AND IT GOT AS HIGH AS 55%, AND IT'S COME DOWN TO MORE LIKE 50

NOW. BUT THESE NUMBERS ARE REALLY MISLEADING BECAUSE WE NEED TO 6

LOOK AT WHAT'S WRONG. IN THE GENERAL SCHOOL-AGE POPULATION,

HERE ARE THE REASONS THAT THEY HAVE VISION LOSS. THE NUMBER ONE

REASON IS MYOPIA. YOU PUT A PAIR OF GLASSES ON THEM, THEY CAN

SEE. SO THOSE NUMBERS ARE UNCORRECTED.

THESE OTHER REASONS-- WE'LL JUST GO THROUGH THEM QUICKLY.

NYSTAGMUS IS WHEN THE EYES MOVE INVOLUNTARILY. THEY BEAT, SO

THEY CAN'T SEE CLEARLY BECAUSE THEIR MACULARS AREN'T STAYING IN

ONE PLACE.

CATARACTS YOU'RE FAMILIAR WITH BECAUSE MOST OF US WILL

DEVELOP THEM IF WE LIVE LONG ENOUGH. IT'S WHEN THE LENS ITSELF

GETS CLOUDY. IT'S NO LONGER CLEAR AND CAN'T SEE CLEARLY.

ALBINISM IS A LACK OF COLOR PIGMENT IN THE EYE, AND THEY ARE SO PHOTSENSITIVE THEY CAN'T SEE.

HYPEROPIA, FARSIGHTEDNESS. AGAIN, CORRECTIBLE.

RETINITIS PIGMENTOSA, R.P., IS ONE OF THE LEADING CAUSES OF BLINDNESS IN THIS COUNTRY. THAT IS WHERE FIRST THE RODS DIE AND

LATER THE CONES START TO DIE. AND SO WHAT YOU HAVE IS TUNNEL

VISION BECAUSE THE RODS ARE DYING OFF.

GLAUCOMA IS THE SECOND LEADING CAUSE OF BLINDNESS IN THIS COUNTRY. THAT'S WHEN THE PRESSURE IN THE EYE INCREASES TOO MUCH. YOU HAVE FLUID IN YOUR EYE, AND IT'S CONSTANTLY REPLENISHING AND DRAINING. IF IT DOESN'T DRAIN PROPERLY OR PRODUCES TOO QUICKLY, THE PRESSURE IN THE EYE STARTS TO PUSH ON

THOSE LITTLE RODS AND CONES AND KILLS THEM. THEY CAN'T TAKE THAT PRESSURE.

OPTIC ATROPHY IS A GENETIC DISORDER WHERE THE NERVE 7 ITSELF JUST DETERIORATES.

>> AUDIENCE: DID YOU SAY THAT RP WAS THE NUMBER ONE LEADING CAUSE OF BLINDNESS?

>> JOSARA WALLBER: SORRY, I'M CONFUSING MY HEARING

PEOPLE AND MY DEAF PEOPLE. THE NUMBER ONE CAUSE OF
BLINDNESS IN

THIS COUNTRY RIGHT NOW IS MACULAR DEGENERATION. NUMBER
TWO IS

GLAUCOMA. THANK YOU FOR CATCHING ME ON THAT. GLAUCOMA
WAS

NUMBER ONE, BUT THE DRUGS THAT WE HAVE NOW TO CONTROL
GLAUCOMA

ARE GETTING BETTER, AND MACULAR DEGENERATION, THEY'VE NOW
FLIPPED.

FOR ALL OF THOSE WHO HAVE AGING PARENTS AND HAVE MACULAR
DEGENERATION, SOME OF THE THINGS YOU SEE TODAY YOU CAN
USE FOR

THEM ALSO.

LET'S LOOK AT WHAT HAPPENS WHEN WE TAKE OUT THOSE

CORRECTIBLES. THAT 25% GOES DOWN TO 8% IN THE GENERAL
PUBLIC

SCHOOLS HAVE AN UNCORRECTIBLE VISION PROBLEM.

I CAN'T TELL YOU ABOUT THIS SCHOOL-AGE DEAF AND HARD OF

HEARING. I DON'T HAVE HOW THEY DECIDED WHAT THEY WERE
GOING TO

REPORT, BUT I DO HAVE WHAT WE FOUND, AND I WILL SHARE THAT
WITH

YOU.

THE NUMBER ONE CAUSE OF A VISION PROBLEM AMONG OUR

STUDENTS FOR THE LAST 18 YEARS HAS BEEN MYOPIA. AGAIN, IT'S

CORRECTIBLE.

YOU'LL NOTICE THAT THE NEXT FOUR CAUSES OF VISION LOSS
HERE ARE THE SAME AS THE HEARING KIDS. AND NOW WE GET INTO
THE
REASON WHY WE HAVE SO MANY MORE HERE. LOOK AT THESE NEXT
ONES. 8

AMBLYOPIA IS A FUNCTIONAL VISION LOSS. IF YOU HAVE AN EYE
THAT'S LOOKING OVER AT THE WALL AND ONE THAT'S LOOKING
STRAIGHT,

AND YOU DON'T FIX THAT BEFORE THAT CHILD IS SIX, YOU CAN'T
FIX

IT. YOU CAN BRING THAT EYE BACK, BUT THE BRAIN IS GOING TO
SAY,

SORRY, I'M NOT LOOKING AT THAT ANYMORE. THE BRAIN DEVELOPS
ITS

PATHWAYS AND RECOGNIZES VISION UP UNTIL ABOUT AGE SIX, AND
THAT'S IT. IT IS NOT VERY PLASTIC. IT'S SET.

ONE OF THE THINGS THAT HAPPENS WITH BABIES WHEN THEY ARE
BORN WITH CATARACTS, IF YOU DON'T -- IF YOU LET THEM SEE
THROUGH

THOSE CATARACTS, THEY WILL BE FUNCTIONALLY BLIND IN SIX
WEEKS

BECAUSE THE BRAIN WON'T DEVELOP NEUROPATHWAYS. SO WE
PATCH

THEIR EYE BECAUSE, DON'T LET THEM SEE UNTIL WE CAN GET
THOSE

CATARACTS OUT, AND THEN THEY'RE FINE. THIS TO ME RAISES A
LOT

OF INTERESTING QUESTIONS ABOUT HEARING AND HOW EARLY WE
AMPLIFY

CHILDREN WITH HEARING LOSS. IT'S KIND OF AN INTERESTING QUESTION.

LET'S LOOK AT THE NEXT FOUR. THESE ARE THE ONES THAT WE SEE MOST OFTEN. USHER SYNDROME, WHICH IS GENETIC HEARING LOSS

AND RETINITIS PIGMENTOSA. WE KNOW THAT THREE TO 5% OF ALL DEAF

AND HARD-OF-HEARING PERSONS HAVE RP. NOW, IT'S INTERESTING,

TOO, IT MAY NOT BE USHER SYNDROME. IT COULD BE SOMEBODY WHO IS

DEAF FROM RUBELLA AND HAS RP. IT JUST HAPPENED THAT THEY HAD

BOTH.

THE NEXT MOST COMMON IS RUBELLA RETINOPATHY, THE INFECTION OF RUBELLA THAT CAUSES THE HEARING LOSS CAN ALSO CAUSE

BLINDNESS OR VARIOUS DEGREES OF VISION PROBLEM. THEN WE HAVE 9

PREMATURITY, CAN CAUSE DEAFNESS AND VISION LOSS. THEN WE HAVE

NF. IS EVERYONE FAMILIAR WITH NF? IT'S A DISORDER WHERE YOU GET TUMORS GROWING ON THE NERVOUS SYSTEM, AND IT -- FOR SOME

REASON, IT SHOWS UP FIRST ON THE AUDITORY NERVE, AND WHEN THEY

TAKE THAT TUMOR OUT, VERY OFTEN THAT PERSON IS DEAFENED, AND IT

HAPPENS USUALLY IN EARLY ADOLESCENCE, AND THE TUMORS CAUSE OTHER

PROBLEMS, INCLUDING VISION PROBLEMS, PARTICULARLY -- THEY GET

VERY DRY EYES, THEIR CORNEAS PEEL OFF, AND SOMETIMES THE TUMORS

INVADE THE EYE.

THIS IS WHAT WE'RE SEEING HERE. WHAT YOU MAY SEE IN

PUBLIC SCHOOLS THAT WE DON'T GET MAY BE CHARGE SYNDROME. IS

ANYONE FAMILIAR WITH CHARGE SYNDROME? IT'S AN ACRONYM FOR A

COMBINATION OF DEFECTS INCLUDES VISION, COGNITIVE, CARDIAC,

DIFFERENT THINGS. WE'VE HAD ONE IN ALL THE YEARS HERE AT

N.T.I.D. I KNOW OF ONE STUDENT WHO HAD ENOUGH COGNITIVE ABILITY

TO MAKE IT HERE.

CMV, WHICH CAUSES HEARING LOSS, CAN ALSO CAUSE RETINAL

PROBLEMS. CMV. SO YOU ARE -- OUR NUMBERS MAY NOT REPRESENT

WHAT YOU MIGHT SEE IN A PUBLIC SCHOOL. YOU'RE SEEING CHILDREN

WHO WOULD LATER NOT GO TO COLLEGE, BUT THIS IS WHAT WE HAVE

FOUND HERE.

WHEN YOU TAKE OUT THOSE KIDS WHO ARE CORRECTIBLE, WE'RE

DOWN TO 17% HERE, WHICH IS STILL PRETTY HIGH.

IT HAS COME DOWN RECENTLY, AND I THINK BECAUSE OF THE AMERICANS WITH DISABILITIES ACT, THE CHILDREN ARE GETTING SERVICED BETTER, AND THEY'RE NOT COMING IN WITH THE AMBLYOPIA WE 10 USED TO SEE, THE FUNCTIONAL VISION LOSS, BECAUSE THEY'VE BEEN

CORRECT.

THERE IS A LEGAL DEFINITION OF BLINDNESS. PEOPLE CAN HAVE A VARIETY OF VISION IMPAIRMENTS, BUT WHEN WE TALK ABOUT

VISUAL ACUITY, WHEN YOU GET TO 20/200, YOU ARE LEGALLY BLIND. I

WANT TO GIVE YOU AN OPPORTUNITY TO SEE WHAT THAT MIGHT LOOK

LIKE. IF YOU HAVE GLASSES, PUT THESE ON TOP OF THEM. YOU WILL NOT BE LEGALLY BLIND, BUT YOU WILL BE CLOSE.

PUT THEM ON AND LOOK FOR A WHILE. YOU'RE CLOSE TO

LEGALLY BLIND LOOKING THROUGH THOSE, AND YOU'LL BE SURPRISED AT

HOW MUCH YOU CAN ACTUALLY SEE. YOU CAN WALK AROUND. YOU COULDN'T DRIVE A CAR, PROBABLY COULDN'T READ THE BOARD, BUT YOU

CAN WALK AROUND.

WE FAIL STUDENTS IN OUR VISION SCREENING PROGRAMS AT

20/40 BECAUSE WE KNOW THAT 20/40 IS WHEN THEY CAN NO LONGER SEE

YOUR LIPS TO LIP READ IN THE CLASSROOM, 20/40. WHEN YOU GET TO

20/60, 20/80, THEY'RE GOING TO HAVE SOME PROBLEM WITH SIGN

LANGUAGE AND THE BLACKBOARD. YOU HAVE IMPAIRED VISION, BUT

YOU'RE NOT TECHNICALLY BLIND UNTIL YOU GET TO BE LOOKING LIKE

THIS.

THE LEGAL DEFINITION INCLUDES ACUITY AND/OR VISUAL FIELD.

20 DEGREES OF VISUAL FIELD, WHICH THEY WOULD TEST OUT ABOUT LIKE

THAT. SO IF YOU HAVE RETINITIS PIGMENTOSA AND YOUR RODS DIE AND

ALL YOU HAVE IS YOUR CONES LEFT, YOU'RE GOING TO SEE ABOUT LIKE

THIS. WHEN YOU PUT THESE ON, YOU WILL HAVE 30 DEGREES OF VISUAL

FIELD. YOU WILL NOT BE BLIND, LEGALLY BLIND. BUT IF YOU HAD TO 11

WALK ANYWHERE, YOU'D REALLY APPRECIATE HOW DIFFICULT IT IS FOR

STUDENTS WITH USHER SYNDROME TO GET AROUND IN THE SCHOOL.

AND YOU'RE CHEATING BECAUSE YOU HAVE AN INTERPRETER TO

LOOK AT. I'M NOT GOING TO WALK AROUND AND YOU HAVE TO FIND ME.

THE OTHER KIND OF BLINDNESS IS COLOR BLINDNESS, WHICH IS

REALLY A MISNOMER. THERE ARE VERY FEW PEOPLE WHO ARE COLOR

BLIND. THERE ARE A LOT OF PEOPLE WHO HAVE DEFECTIVE COLOR VISION. IN FACT, ONE OUT OF EVERY TEN MALES SEES COLOR

DIFFERENT THAN -- QUOTE -- NORMAL. RED/GREEN DEFECTIVE OCCURS

IN 8% OF ALL MALES AND .5% OF ALL FEMALES. IT'S HEREDITARY.

IT'S ON THE X CHROMOSOME, WHICH IS WHY IT SHOWS UP IN MEN MORE

OFTEN BECAUSE IT DOESN'T GET MASKED BY THAT Y. CHROMOSOME. THEY

SEE RED AND GREEN AS THE SAME COLOR. SO IF YOU HAVE -- IF

YOU'RE WORKING WITH YOUNG STUDENTS, BE SENSITIVE TO WHEN YOU

TELL JOHNNY TO GO TO THE RED GROUP AND HE GOES TO THE GREEN

GROUP. HE CAN'T TELL THE DIFFERENCE. HE'S NOT STUPID. HE JUST CAN'T SEE IT. IT'S MUCH MORE COMMON THAN YOU THINK.

WE SEE SOME MONOCHROMATICS, AND THOSE ARE PEOPLE WHO ARE

TRULY COLOR BLIND. THEY HAVE NO CONES. THEY ONLY HAVE RODS.

AND THEY ARE SQUINTING AND WEARING SUNGLASSES BECAUSE ALL THEY

HAVE ARE RODS, WHICH ARE VERY SENSITIVE TO LIGHT. OF COURSE, IF

YOU'RE ONLY LOOKING WITH RODS THINGS AREN'T GOING TO BE VERY

CLEAR. TRY THIS, PUT YOUR FIST OUT IN FRONT OF YOU, AND LOOK AT

YOUR FIST, FOCUS ON YOUR FIST, AND NOTICE WHAT THE REST OF THE

ROOM LOOKS LIKE. THAT'S HOW THE KID WITH NO CONES IS GOING TO

GO THROUGH LIFE. THAT'S HOW HE SEES ALL THAT AROUND HIM. 12

WE START TO SEE COLOR VISION PROBLEMS IN THESE OTHER

DISEASES: STUDENTS WITH PREMATUREITY, ADVANCED R.P. ONCE THOSE

CONES ARE AFFECTED, THEY WILL NOT HAVE VERY GOOD COLOR VISION.

SO YOU HAVE TO BE CAREFUL HOW YOU USE COLOR EDUCATIONALLY.

WE USE RED IN THE DARKROOM BECAUSE IT HAS SO LITTLE

ENERGY IT WON'T DEVELOP YOUR FILM. SO YOU DON'T WANT TO USE RED

FOR THESE KIDS TO TRY TO SEE IT BECAUSE THEY'RE NOT GOING TO BE

ABLE TO SEE RED.

MONOCULAR VISION. WE HAVE A LOT OF STUDENTS WITH

MONOCULAR VISION. THEY HAVE ONE FUNCTIONAL EYE. BECAUSE THEY

HAD STRABISMUS, WHICH IS WHERE THAT ONE EYE WAS LOOKING OVER

HERE AND IT DIDN'T GET CORRECTED IN TIME, SO THE EYE BASICALLY

DOESN'T FUNCTION VERY WELL ANYMORE. THEY HAVE APHAXIA, WHICH IS

NO LENS IN THAT EYE SO THEY DON'T SEE VERY WELL. OR THIS NEXT

TERM, ANISOMETROPIA -- THAT'S A TOUGH ONE. WHAT THAT IS, IS
THEY HAVE ONE EYE THAT SEES ONE WAY AND ONE EYE THAT SEES
ANOTHER WAY, AND IT WASN'T PICKED UP IN TIME TO CORRECT
THEM AND

MAKE THEM WELL, AND THE BRAIN JUST SAID, I CAN'T DEAL WITH
THIS.

I'LL TAKE THIS ONE AND SHUT THIS ONE OFF.

SO IF YOU HAVE A CHILD WHO HAS A LOT OF ASTIGMATISM IN

ONE EYE AND A NORMAL EYE, AND YOU DIDN'T GET THIS
CORRECTED, AND

BY THE TIME HE'S ABOUT SIX, THE BRAIN IS SAYING, I DON'T LIKE
THIS, AND IT'S GOING TO TURN IT OFF. WE SEE QUITE A BIT OF
THAT. WE'RE SEEING LESS OF IT, I THINK, AS WE SEE STUDENTS FIT
BETTER.

AND OF COURSE THEN YOU HAVE INFECTIONS AND INJURIES. 13

THE STUDENTS WHO COME HERE WHO HAVE ONE FUNCTIONAL EYE

AND ARE DEAF AND WILL NOT WEAR PROTECTIVE LENSES BREAK MY
HEART

BECAUSE THEY'RE THIS CLOSE TO DEAF-BLINDNESS, AND THEY JUST
DON'T BELIEVE YOU.

>> AUDIENCE: I REALIZE THIS IS SUCH A STUPID QUESTION

BUT I BETTER ASK IT: FOR A PERSON WHO HAS ONE GOOD EYE,
20/20,

AND A FALSE EYE OR GLASSES, WHAT WOULD THAT PERSON BE
CALLED?

>> JOSARA WALLBER: MONOCULAR. THEY HAVE MONOCULAR

VISION, ONE EYE. THE OTHER THING YOU DON'T HAVE IF YOU HAVE ONE

EYE, YOU HAVE NO DEPTH PERCEPTION. FOR ADULTS, IT'S NOT REALLY

A PROBLEM, BECAUSE THEY LEARN FROM EXPERIENCE BY SIZE HOW FAR

THINGS ARE. BUT IN YOUNG CHILDREN, THEY DON'T HAVE THAT

EXPERIENCE YET, AND WHEN YOU'RE IN A CLASSROOM OR SPORTS IS

WHERE YOU'LL SEE IT. THEY'LL GET HIT RIGHT IN THE FACE WITH A

BALL BECAUSE EVERYTHING IS FLAT. I DON'T KNOW THE STATISTICS ON

IT, BUT WE DO HAVE SOME HERE, AND I KNOW HEARING PEOPLE LIKE

THIS, THEY HAVE TWO GOOD EYES, BUT THEY SWITCH. I DON'T KNOW

WHAT MAKES THEM SWITCH. IF I TEST THEM, 20/20, 20/20, BUT

DEPTH, NOTHING. THEY SWITCH THEM, AND I DON'T KNOW WHY. SO YOU

CAN'T ASSUME AND YOU NEED TO CHECK IT IF YOU'RE WORKING WITH

YOUNG CHILDREN.

LET'S TALK ABOUT STRATEGIES. I HAVE A BOOK FOR YOU I'M

GOING TO GIVE YOU ON YOUR WAY OUT. I HAD THE PLEASURE OF

WORKING WITH A MASTERS STUDENT FROM THE MASTERS FOR THE

SECONDARY EDUCATION FOR THE DEAF THIS YEAR, AND HE TOOK ALL MY

STUFF AND ORGANIZED IT AND PUT IT IN A BOOK FOR YOU. YOU DON'T 14

NEED TO TAKE A LOT OF NOTES. THIS IS REALLY FOCUSED ON USHER

SYNDROME, BUT THE TECHNOLOGY I TALK ABOUT IS IN HERE, THE CATEGORIES, WHERE TO ORDER IT ARE IN HERE, THE BRAND NAMES, THE

WEB SITES, IT'S ALL IN HERE. WHEN I TALK ABOUT THIS, KNOW YOU'RE GOING TO GET ALL OF IT WHEN YOU LEAVE.

THE FIRST THING YOU NEED TO DO WHEN WORKING WITH THESE STUDENTS IS GET SOME KIND OF EVALUATION AND FIND OUT WHAT THEY

CAN SEE. IF YOU CAN AFFORD TO GET THEM INTO A LOW-VISION TESTING, GREAT. IF NOT, SIT THEM DOWN AND SHOW THEM DIFFERENT

FONT SIZES AND FIND OUT WHAT THEY CAN READ. PROJECT SOMETHING

UP ON THE CLASSROOM WALL. FIGURE OUT WHAT THEY'RE GOING TO NEED

AND GIVE THAT TO THE TEACHER SO THEY KNOW. YOU NEED TO KNOW

WHAT SIZE THEY NEED FOR READING, PROJECTION, COMPUTER SCREENS,

BOOKS, THAT KIND OF THING. THEN YOU NEED TO KNOW, IF THEY HAVE

VISUAL FIELD PROBLEMS, ARE THEY GOING TO NEED SOME HELP WITH

MOBILITY? HOW SAFE ARE THEY WALKING AROUND IN YOUR ENVIRONMENT?

LET'S TALK ABOUT GENERAL SCHOOL ENVIRONMENT. ORIENTATION AND MOBILITY, HOW SOMEBODY TAKES A STUDENT AND SHOWS THEM AROUND

THE BUILDING SO THEY KNOW WHERE THE STAIRS ARE SO THEY'RE SAFE.

THEY AREN'T GOING TO USE CANES WHEN THEY'RE YOUNG KIDS. THEY

WON'T USE CANES HERE YET.

BE SENSITIVE TO PASSING TIME IF YOU'RE IN A LARGE SCHOOL.

IF THEY'VE GOT A FIELD THIS BIG AND THEY'RE TRYING TO BUMP YOUR

WAY DOWN THE HALLWAY, MAYBE THEY SHOULD BE LET OUT EARLIER SO

THEY CAN GET TO THE CLASSROOM BEFORE THE REST OF THE STUDENTS.

FURNITURE: TEACHERS SHOULDN'T GO IN AND CHANGE THE 15

FURNITURE IN THE CLASSROOM WITHOUT TELLING JOHNNY WHERE IT'S

GOING TO BE WHEN HE GETS BACK TOMORROW. DON'T LET PEOPLE PUT

STUFF OUT IN THE HALLWAYS. THIS THING RIGHT HERE, IF I HAVE A VISUAL FIELD THIS BIG, I'M NOT EVEN THERE. I'M GONE, THEY FALL RIGHT OVER IT.

DOORS: IF YOU HAVE A DOOR THAT WANDERS, BLOCK IT OPEN OR KEEP IT SHUT BECAUSE THEY'RE GOING TO WALK RIGHT INTO IT.

EVACUATION: ASSIGN A BUDDY, SOMEBODY WHO WILL GET THAT STUDENT OUT IF THERE'S A FIRE DRILL. AND SPORTS, BE SENSITIVE

ABOUT SPORTS. THEY MIGHT NOT BE ABLE TO CATCH THE BALL, BUT THEY MIGHT BE ABLE TO RUN TRACK, SO HELP THEM MAKE SOME DECISION

AND DEVELOP SKILLS THAT THEY CAN ACTUALLY PARTICIPATE IN.

TYPE ONE USHER SYNDROME HAS NO BALANCE. THEY HAVE THE DEAF-BLIND WALK. THEY DON'T HAVE ANY BALANCE. THEIR VESTIBULAR

NERVE WAS WIPED OUT WHEN THEY BECAME DEAF. IF THEY DIVED INTO A

SWIMMING POOL, THEY MAY NOT KNOW WHICH WAY IS UP, SO BE SENSITIVE TO THAT KIND OF THING. THEY HAVE ABSOLUTELY NO BALANCE.

CLASSROOM COMMUNICATION, SOME STRATEGIES. AND THESE ARE GLOBAL. EVERYBODY IS GOING TO BE DIFFERENT. BUT REDUCE BACKGROUND DISTRACTIONS, ENSURE THERE'S ADEQUATE LIGHTING. IF

YOU HAVE A KID WHO IS MONOCHROMATIC, BRIGHT LIGHTS ARE JUST

GOING TO KILL HIM. BUT IF YOU HAVE A STUDENT WITH USHERS, DIM

LIGHTS ARE GOING TO MAKE HIM BLIND. IT'S VERY INDIVIDUAL. YOU HAVE TO KNOW WHAT THEY SEE.

REDUCE UNNECESSARY MOVEMENT. IF I'M TEACHING IN A DEAF 16 CLASSROOM AND I'M DOING THIS AND JOHNNY IS BACK THERE TRYING TO

FIND ME, HE'S NEVER GOING TO SEE WHERE I AM. HE HAS TO KEEP MY

HAND IN THAT LITTLE FIELD PLUS FIND WHERE I'M GOING IN THE ROOM

SO I NEED TO STAY PUT. SO YOU MAY WANT TO USE A COPY SIGNER, I

HAVE SOMEBODY SIGNING WHAT I'M SIGNING SITTING RIGHT IN FRONT OF

THAT STUDENT. THEY'RE NOT GOING TO FIND THE OTHER STUDENTS IN

THE CLASSROOM SO YOU NEED TO REPEAT WHAT'S SAID AND SIGNED. IF

YOU'RE DARK SKINNED, WEAR LIGHTER CLOTHING, AND VICE VERSA.

MAXIMIZE RESIDUAL HEARING. WE'RE SEEING COCHLEAR

IMPLANTS BECOMING MORE POPULAR IN GENERAL, BUT PARENTS WHO FIND

OUT THEIR STUDENT HAS USHER SYNDROME ARE VERY KEEN TO TRY

COCHLEAR IMPLANTS BECAUSE THAT STUDENT IS GOING TO BE DEAF-BLIND

WHEN HE'S AN ADULT. SO IF THEY CAN GET SOME RESIDUAL HEARING,

IT'S ALL TO THE GOOD. THINGS TO MAXIMIZE WHATEVER RESIDUAL

HEARING THEY HAVE. MAKE SURE YOU HAVE PREFERENTIAL SEATING. IF

YOU HAVE A SOUND FIELD SYSTEM LIKE WE'RE USING HERE, OR IF THEY

HAVE F.M., MAKE SURE THE TEACHER IS RECEPTIVE TO THAT.

WHEN YOU'RE WORKING ON THE BOARD, DESCRIBE WHAT YOU'RE

WRITING SO THEY CAN FOLLOW IT. MAKE SURE THE SIZE IS

APPROPRIATE. IF YOU'VE GOT A LITTLE TEENY FIELD AND YOU PUT IT

UP THERE IN BIG, HUGE LETTERS, HE CAN'T SEE THE WHOLE THING AT

ONE TIME. OR IF HE'S GOT RETINOPATHY PREMATUREITY HE CAN'T SEE

IT UNLESS IT IS THAT BIG. USE BLACKBOARDS WITH WHITE CHALK.

USE BLACK ON WHITE BOARDS. USE A WHITE BOARD WITH BLACK MARKER,

OR YELLOW CHALK ON A BLACKBOARD IS YOUR BEST BET. DON'T USE

COLORS. YOU GET TEACHERS USING LIME GREEN AND RED, AND THE KID 17

CAN'T SEE HALF OF THEM BECAUSE OF THE COLOR VISION PART OF IT.

STAY CLOSE TO THE IMAGES, AND WHEN POSSIBLE, GIVE HIM A

HARD COPY BEFORE THE LECTURE SO THEY CAN FOLLOW ALONG. SOME OF

THE KIDS CAN HOLD THAT RIGHT UP IN FRONT OF THEIR FACE SO THEY

CAN SEE IT. THANK GOD WE'RE NOT USING THE DITTO MACHINES

ANYMORE BECAUSE COPIES WERE SO TERRIBLE. GIVE THE STUDENT THE

ORIGINAL LASER-PRINTED COPY SO HE HAS THE BEST VIEW OF IT.

HAND-HELD MAGNIFIERS WORK FOR SOME STUDENTS. THIS IS ONE, ONE

OF MY STUDENTS USES BECAUSE HE CAN HANG IT AROUND HIS NECK AND

PUT HIS MATERIAL DOWN HERE. THEY SELL THESE FOR OLD LADIES WHO

DO NEEDLEPOINT. SOME CAN BENEFIT FROM A MONOCULAR SCOPE WHERE

THEY CAN SEE WHAT'S ON THE BOARD. THEY WEAR THIS AROUND THEIR

NECK, AND WHEN THEY GET OUT THEY CAN FIND WHERE THEY'RE GOING,

WHICH BUS THEY'RE GOING TO GET ON.

AND LARGE BOOKS ARE AVAILABLE IF YOU'RE TEACHING

LITERATURE, IF YOU'RE TEACHING COMPUTER SCIENCE, FORGET IT.

ELECTRONIC TEXT, THOUGH, IS ON THE HORIZON. IT'S COMING. YOU

CAN DOWNLOAD IT TO A LAPTOP, TO YOUR HANDHELD, TO ANYTHING. YOU

CAN DOWNLOAD NOW, AND THEN YOU CAN BLOW IT UP.

SO ELECTRONIC TEXT IS GOING TO BE A REAL BOON FOR THESE

PEOPLE.

CLOSED CIRCUIT TELEVISIONS. HERE I HAVE A HANDOUT FOR A

STUDENT WHO IS VISUALLY IMPAIRED. HE CAN'T SEE IT.

THIS IS CALLED A CCTV THAT BONNIE IS GOING TO PUT THIS

PIECE OF PAPER UP HERE FOR YOU. IF YOU CAN'T GET THE BOOK IN

LARGE PRINT, YOU CAN BUY ONE OF THESE, \$2,000, AND PUT IT IN
18

YOUR LIBRARY. IF THE STUDENT HAS A SIGNIFICANT VISUAL

IMPAIRMENT, USUALLY THEY CAN GET THE COMMISSION FOR THE BLIND OR

VR TO BUY THEM THIS AND HAVE IT IN THEIR DORM ROOM.

THE BEAUTY OF THIS, AS YOU CAN SEE, BONNIE HAS BLACK WITH

WHITE PRINT AND YOU CAN CHANGE IT TO WHITE WITH BLACK
PRINT AND

IT'S SO MUCH EASIER FOR THEM TO READ. THIS WORKS OUT REALLY

WELL. WE HAVE THIS IN STRATEGIC PLACES ON OUR CAMPUS AND
WE

HAVE ABOUT SIX STUDENTS THAT USE IT REGULARLY.

>> AUDIENCE: IF YOU HAD A WEB PAGE, AND MANY PAGES, PAGE

AFTER PAGE OF READING, WOULD IT BE GOOD TO HAVE THE WHOLE
SITE

SET UP WITH WHITE TEXT ON BLACK BACKGROUND?

>> JOSARA WALLBER: YOU DON'T HAVE TO DO THAT. YOU CAN

DO IT YOURSELF.

THE OTHER THING YOU CAN DO IS ENLARGE BY PHOTOCOPYING. I

THREW THIS TAX RETURN INTO A COPY MACHINE, AND ENLARGED IT,
AND

I ONLY HAD ABOUT TWO STUDENTS WHO COULDN'T SEE THIS. THIS
IS

CHEAP TO DO ON YOUR COPY MACHINES. AND SOMETIMES YOU CAN
GET

MORE -- 129 WILL ALWAYS FIT ON 11 X. 17. THAT'S IN YOUR BOOK.

THE HANDOUT I GAVE YOU THIS MORNING, HERE IT IS AT 129 ON 11
X

17, SO THAT'S THE QUICKEST WAY TO DO IT. YOU GET TEACHERS
THAT

SAY, OH, MY GOD. I CAN'T BLOW EVERYTHING UP. SO YOU GET
THEIR

HANDOUTS AND RUN TO THE COPY MACHINE AND HAND THEM OUT.

STUDENTS DON'T LIKE THIS PAPER, BUT, HEY, LIFE'S TOUGH.

THE NEXT THING I'M GOING TO BRIEFLY TOUCH ON IS

ENHANCEMENT. THERE ARE LOTS OF WAYS TO ENHANCE. YOU CAN DO

THERMAL-RAISED PAPER. I'LL PASS THIS AROUND. THIS IS LIKE THE
19

OVERHEAD MACHINES. YOU CAN BUY ONE OF THESE MACHINES, AND YOU

FEED THE SPECIAL PAPER THROUGH IT, AND WHATEVER IS ON THE PAPER

COMES OUT RAISED. HERE ARE TWO SAMPLES OF IT. YOU CAN BUY A

COMPUTER PROGRAM THAT WILL TRANSLATE YOUR TEXT INTO BRAILLE AND

PRINT IT IN DOS AND FEED IT THROUGH THIS MACHINE AND YOU HAVE

BRAILLE. A LOT CHEAPER THAN BUYING A BRAILLING MACHINE. WHERE

YOU BUY THIS STUFF IS ALL IN YOUR LITTLE BOOK YOU'RE GOING TO GET. IT'S GREAT FOR GRAPHS.

HERE ARE SOME OTHER ENHANCEMENT OPTIONS: RECORDINGS FOR THE BLIND AND DYSLEXIC -- THIS IS ALL IN YOUR BOOK.

VOICE-RECOGNITION SOFTWARE CAN WORK FOR SOME STUDENTS WHO CAN

SPEAK.

COMPUTERS: ADJUST THE COLOR OF THE SCREEN SO THEY CAN SEE IT. YELLOW ACETATE -- I'M GOING TO GIVE THIS TO BONNIE SO YOU CAN SEE WHAT IT DOES. A LOT OF STUDENTS BENEFIT FROM

PUTTING YELLOW ACETATE OVER THEIR PAGES AND COMPUTER SCREENS.

IT REDUCES THE GLARE, INCREASES THE CONTRAST. IF YOU HAVE A CATARACT, YOU WOULD LOVE THIS. IN FACT, FOR CATARACTS THEY SELL

ALL KINDS OF VISION ENHANCEMENT GLASSES. THESE ARE THE ONES

MADE IN NEW YORK, SPECIAL GLARE-REDUCTION GLASSES. A LOT OF OUR

STUDENTS WEAR THE NEXT LIGHTER YELLOW ONE UNDER FLORESCENT

LIGHT, BECAUSE THERE IS SO MUCH BLUE ENERGY IN THESE LIGHTS IT'S

AWFUL. THEY LIKE INCANDESCENT BULBS. REGULAR YELLOW LIGHTING

IS MUCH MORE COMFORTABLE FOR THOSE STUDENTS. IF YOU CAN GIVE

THEM A LAMP ON THEIR DESK, THEY WILL APPRECIATE THAT.

KEYTOP ENLARGERS ARE PASTE-ON KEY THINGS YOU CAN PASTE 20 RIGHT ON THE COMPUTER KEYS. THEY COST A BUCK. THEY'RE IN THE CATALOG THAT I'M GOING TO GIVE YOU A COPY OF.

ENLARGING SOFTWARE-- WE'RE GOING TO ALLEN'S QUESTION, IF YOU HAVE A WEB SITE. IF A STUDENT IS VISUALLY IMPAIRED ENOUGH,

THEY'RE PROBABLY GOING TO BE SUPPORTED, FIND ENLARGING SOFTWARE

THAT THEY CAN BLOW IT UP THEMSELVES. ENLARGING SOFTWARE, THE

TWO BEST SELLERS ARE INLARGE FOR MACs, ZOOM TEXT FOR PCs.
THIS

IS IN YOUR YELLOW BOOK. CONSUMERS OF THIS SOFTWARE RATE
ZOOM

TEXT NUMBER ONE AND LUNAR PLUS NUMBER TWO. THOSE ARE
BOTH P.C.

THEY'RE BOTH IN YOUR YELLOW BOOK. PEOPLE WITH DISABILITIES
IN

GENERAL DO BETTER BUYING PCs RATHER THAN MACS BECAUSE THE
SOFTWARE TO SUPPORTED THEM IS MOST LIKELY IN THE P.C.
REALM.

MACS, THEY'RE JUST NOT THERE. SO IF YOU HAVE A CHOICE, GO
WITH

THE P.C. THIS SOFTWARE WILL HAVE A TON OF STUFF ON IT. THEY
CAN CHANGE FROM BLACK TO WHITE, BLOW IT UP, ZOOM IN, THEY
CAN

MAKE THE CURSOR BIGGER. SOME OF THEM WILL TELESCOPE IN TO
WHERE

THE MOUSE IS SO THEY CAN FIND IT, WHICH IS THE NEXT ITEM ON
HERE

-- CURSOR LOCATORS AND ENLARGED MOUSES.

YOU CAN BUY THEM AS SINGLE THINGS OR THEY'RE IN THE

ENLARGING SOFTWARE. SOME OF THEM ARE FREE DOWNLOADABLE
THINGS

ON THE WEB, AND ALL THOSE WEB SITES ARE LISTED IN THE
YELLOW

BOOK. BUT JUST SO YOU KNOW TO MAKE THE MOUSE BIG AND THEY
FIND

WHERE THEY'RE GOING. IT CAN BE VERY HELPFUL.

WHEN YOU'RE PROJECTING MATERIALS MAKE SURE THE PRINT SIZE IS ADEQUATE. USE A POINTER. I'M NOT DOING THAT. I'M NOT A GOOD EXAMPLE. THE ACETATE OVERLAY. IF YOU'RE GOING TO SHOW A 21

VIDEOTAPE, MAKE IT AVAILABLE TO THEM OUTSIDE OF THE CLASSROOM.

ADJUST THE LIGHTING, AND WHEN POSSIBLE, GIVE THEM A HARD COPY.

OTHER IDEAS: DON'T CORRECT IN RED. IF YOU'RE GOING TO

WRITE COMMENTS ON THEIR PAPER, TYPE THEM AND HAND THEM OUT.

GIVE THEM NOTETAKERS. IF YOU'RE GOING TO HAVE A TEST WHERE YOU

HAVE THE COMPUTER -- THE THING WHERE YOU BUBBLE IT IN, HAVE THEM

WRITE THEIRS DOWN AND GIVE IT TO SOMEBODY ELSE TO BUBBLE FOR

THEM. THAT'S JUST A NIGHTMARE FOR THOSE STUDENTS. THEY CAN'T

FIND THEM. GIVE THEM EXTENDED TIME FOR TESTS. BE SENSITIVE TO

MOBILITY, USE. IF THEY'RE GOING TO BE LATE, FIND OUT, WHAT'S THE PROBLEM? YOU CAN TEACH THEIR PEERS HOW TO SIGHT GUIDE.

THE LAST THING I WANT TO TALK ABOUT JUST BRIEFLY IS

TRANSITION. EVERY KID, BY LAW, SHOULD HAVE A TRANSITION IEP.

THE IEP SHOULD HAVE TRANSITION TO ADULT LIFE. THEY SHOULD

UNDERSTAND YOUR RIGHTS AND RESPONSIBILITIES UNDER SECTION 504.

REFER THEM TO THE AGENCIES IN YOUR LOCALITY, THAT'S THE COMMISSION FOR THE BLIND. GET THEM ORIENTATION MOBILITY SO WHEN

THEY LEAVE THEY HAVE A CANE, KNOW HOW TO USE IT, KNOW HOW TO GET

TO BUS TO GET TO WORK BECAUSE THEY AREN'T GOING TO HAVE A DRIVER'S LICENSE. GIVE THEM SOME EMPLOYMENT OPPORTUNITIES IF

YOU CAN. DAILY LIVING SKILLS. MAKE SURE THEY KNOW HOW TO BOIL

WATER SAFELY, THOSE KINDS OF THINGS. AND OF COURSE, ASSISTIVE

TECHNOLOGY. IF THE LAWS GO WHERE THEY'RE GOING TO GO, THESE

KIDS SHOULD BE COMING OUT OF HIGH SCHOOL AND TAKING THAT ASSISTIVE TECHNOLOGY WITH THEM. THAT WOULD BE NICE FOR US. WE

HAVE FIVE MINUTES BECAUSE I TALKED SO FAST. 22

>> DO YOU SEE THIS LASER SURGERY REDUCING ANY OF THAT?

>> JOSARA WALLBER: WHAT THE LASER SURGERY IS -- THERE

ARE MANY DIFFERENT TYPES OF LASER SURGERY. WE STARTED OUT WITH

RK, WHICH IS RADIAL KERATOMY, WHERE THEY DID LITTLE ROUND CUTS

ON THE CORNEA TO MAKE IT FLAT SO YOU COULD REDUCE SOME OF THE

REFRACTIVE ERROR. NOW THEY'RE DOING FLAP SURGERY WHERE THEY

PULL THE FRONT OF THE CORNEA UP AND SHAVE IT WITH A LAZER
AND

PUT THE FLAP DOWN. THAT'S BETTER, BUT IT'S NOT -- DON'T DO IT
YET. THE PROBLEM IS YOU HAVE THE FRONT OF A CORNEA BUT YOU
HAVE

THE BACK OF THE CORNEA AND HAVE EVERYTHING IN BETWEEN. IF
YOU

SHAVE IT IN THE FRONT, YOU MIGHT COME OUT OKAY. SOME PEOPLE
DO,

BUT SOME DON'T BECAUSE THEY HAVE AN IRREGULAR BACK.
THERE'S A

NEW TECHNOLOGY THEY'RE WORKING ON RIGHT NOW CALLED WAVE
FORM

TECHNOLOGY. IT COMES FROM SPACE EXPLORATION. THEY CAN
VISUALIZE THE CORNEA IN THREE DIMENSIONS. THEY CAN SEE
WHERE

IT'S THICK, BUMPY, WAVY, AND THEN THEY MAKE THE DECISIONS
ON HOW

TO SHAPE THE FRONT OF IT BECAUSE OF THE WHOLE THREE-
DIMENSIONAL

OBJECT. THEY'RE DOING HUMAN TRIALS RIGHT NOW AND GETTING
20/15

VISION ON THESE PEOPLE, SO IT'S REALLY EXCITING.

BUT WAIT UNTIL IT'S OUT IF YOU'RE GOING TO DO IT

YOURSELF. AND THEY CAN ONLY CORRECT SIX DIOPTERS, UP TO
NEGATIVE SIX SO IF YOU KNOW WHAT YOUR VISION IS.

I'M NEGATIVE 14. I COULD GET GLASSES HALF AS THICK.

>> AUDIENCE: ONE OF THE REASONS I ASK IS MY SON IS DEAF

AND HE HAD THAT DONE, AND HE TELLS ME HE SEES GREAT.

>> JOSARA WALLBER: HOW DOES HE SEE AT NIGHT? 23

>> I'M NOT REAL, REAL SURE.

>> JOSARA WALLBER: THEY GET SOME GLARE PROBLEMS AT NIGHT
BECAUSE OF THE SCARRING. WE JUST DON'T KNOW HOW IT'S GOING
TO

TURN OUT IN THE LONG RUN. IF YOU'RE THINKING ABOUT IT, I
WOULD

WAIT FOR THIS WAVE FORM BUSINESS TO GET OUT THERE IN THE
MARKETPLACE.

>> AUDIENCE: IT WILL PROBABLY BE 100 YEARS BEFORE IT
GETS DOWN TO A PRICE ANYBODY CAN AFFORD ANYWAY.

>> JOSARA WALLBER: YOU KNOW, I PERSONALLY AM OF THE
OPINION IF IT CAN BE CORRECTED WITH GLASSES, THANK YOUR
LUCKY

STARS AND JUST DO IT. I HAD A DEAF STUDENT WHO WENT DOWN
TO

COLUMBIA AND HAD REFRACTIVE SURGERY. HE IS NOW
CORRECTIBLE TO

20/40. THAT'S ALL HE WILL EVER SEE AGAIN, AND HE WILL HAVE TO
WEAR GLASSES STILL, AND HE WAS 20/20. WHY MESS WITH IT?

>> AUDIENCE: YOU TALK ABOUT E-TEXT BEING ON THE HORIZON?
HOW SOON DO YOU SEE THAT COMING INTO PLAY AND WHERE ARE
THE
RESOURCES FOR IT?

>> JOSARA WALLBER: IT IS HERE. THE TECHNOLOGY IS ALL

OVER THE PLACE RIGHT NOW. YOU CAN BUY ROCKET BOOKS.
THEY'RE

DEDICATED BOOKS. THEY'VE GOT THEM OVER AT THE WALLACE
LIBRARY.

AND YOU CAN DOWNLOAD BOOKS FROM PUBLISHERS. YOU CAN
HAVE SIX

BOOKS AT A TIME, BACKLIGHT IT, CARRY IT AROUND WITH YOU,

UNDERLINE IT, SEARCH IT FOR WORDS. IT'S REALLY GREAT

TECHNOLOGY. SOME OF THEM YOU CAN BUY ON LINE AND
DOWNLOAD TO

YOUR COMPUTER. MY HUSBAND PUTS THEM ON HIS PALM PILOT SO
HE'S

ALWAYS GOT A COUPLE OF BOOKS IN HIS PALM. THE PROBLEM IS
IT'S 24

NOT A STANDARD TECHNOLOGY YET. THERE'S ALL KINDS OF PEOPLE

DOING IT, AND UNTIL IT GETS STANDARDIZED, IT'S GOING TO BE

DIFFICULT.

THE FEDERAL GOVERNMENT IS GETTING INVOLVED IN SAYING THEY

HAVE TO MAKE THIS STUFF AVAILABLE. IT'S LIKE THE

TELECOMMUNICATIONS ACT, WE HAD TO MAKE ALL THE PHONES
COMPATIBLE

WITH THE HEARING AIDS. AND WE'RE GOING TO GET TO THE POINT

WHERE EVERY HEARING IMPAIRED PERSON HAS A RIGHT TO GET IT.
YOU

CAN GET MAINSTREAM BOOKS BUT NOT TEXTBOOKS. THERE IS ONE
WEB

SITE DOING TEXT BOOKS, WHO WILL PUT YOUR TEXT BOOKS UP FOR
YOU

FOR FREE THAT THEY'RE MARKETING TO PROFESSORS. BUT I DON'T KNOW

HOW LONG IT'S GOING TO TAKE TO BE HONEST.

>> AUDIENCE: SO PIGGYBACKING ON HIS QUESTION, STATE

ADOPTED TEXTBOOKS FOR THOSE OF US IN THE PUBLIC SCHOOL SECTOR,

YOU'RE SAYING THAT'S AVAILABLE?

>> JOSARA WALLBER: YOU KNOW THE PUBLISHER HAS IT. HE

DOESN'T HAVE TYPESET ANYMORE. HE DOES IT ELECTRONICALLY SO I

WOULD CONTACT HIM. THE MORE WE PUSH THAT WE HAVE A DISABLED

STUDENT WHO CAN'T READ IT -- BY THE WAY, I FORGOT TO MENTION,

JANET, OUR CAPTIONING, IS USING ZOOM TEXT, SO YOU CAN SEE THAT

FROM HER LAPTOP. SHE'S USING A VERSION CALLED LAPZOOM, SO YOU

CAN SEE THAT.

AND THAT'S ALL IN YOUR LITTLE BOOK. OTHER QUESTIONS?

IT'S QUARTER TILL. I KNOW YOU HAVE PLACES TO GO. IF ANYONE

WOULD LIKE TO TALK TO ME INDIVIDUAL OR LOOK AT ANY OF MY TOYS,

PLEASE FEEL FREE TO STAY. THIS ROOM IS NOT GOING TO BE USED
25

AGAIN UNTIL THIS AFTERNOON. ONE LAST WORD FROM OUR MODERATOR.

>> ONE LAST THING. CAN YOU PLEASE WRITE ON THE

EVALUATION FORMS EITHER ON THE PAPER COPY OR ON THE NLC, IN THE

COMPUTER ROOM, WRITE THE EVALUATIONS, AND THEN GIVE THAT TO THE

INFORMATION DESK HERE, OR YOU CAN USE THE NLC COMPUTERS. THE

NUMBER OF THIS WORKSHOP IS T10 D.

THANK YOU.