Captions

(T10D)

Technology to Support Visually-Impaired Deaf

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

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National Technical Institute for the Deaf


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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 2 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 PHOTOSENSITIVE

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 PHOTOSENSITIVE THEY CAN'T SEE.
HYPEROPIA, FAR-SIGHTEDNESS. 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 SOMEBOY 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 PREMATURITY, 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 PREMATURITY 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 VISIONEnhancement GLASSES. THESE ARE THE ONES

MADE IN NEW YORK, SPECIALglare-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 MICE.

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.