"Wargames"

Girl: What are you doing?

Boy: I'm dialing into the school's computer

G: Are those your grades?

B: Yeah. I don't think I deserve that F, do you? [changes F to C]

G: You can't do that!

B: Already done. Do you have a middle initial?

G: K. Katherine. Those are my grades.

B: How can anybody get a D in home ec?

G: That's none of your business. Can you erase this, please?

B: No. It's too late.

G: What are you doing?

B: I'm changing your biology grade.

G: No, I don't want you to do that, you're going to get me in trouble.

B: No, nobody can find out. There, you just got a C. Now you don't have to go to summer school.

G: Change it back!

B: Why? They can't possibly …

G: I said, change it back!

B: OK, OK.

G: I guess I better get going.

B: Thanks for the ride. [She leaves. He changes her F to an A]

Computer Whiz Kids

Narrator: Beyond the imagination of the movie producers is a real world where hs students have become Computer Whiz Kids. From designing your own courses, writing your own textbooks, and learning many subjects through the use of a microcomputer.

Here at George Washington High School in Denver, Colorado, is a nationally recognized computer lab. It was organized and developed by **Dr. Irwin Hoffman**.

Hoffman: Back in 1960, a neighbor of mine, **Robert Albrecht**, talked to me about Fortran and computer programming. I invited him to talk to my mathematics club. And the end result was a sojourn to the Control Data offices every Wednesday night and every Satutrday morning. And there we learned. And from there we borrowed computers for the next 7 years, until the Denver Public Schools gave us a computer that was recovered in a flood. IBM donated a computer that was in a flood and one of our people in the schools, **Larry** *Kaufman?,* took it apart, piece by piece, dried it out, and put it back together again, and that was the first computer in the DPS, 1967.

Since that time, we've had formal computer programming in our school system, and this laboratory has been a leader in developing the curriculum. Our students have always pursued excellence. And during the years, we've written our own manuals, and we've done some wonderful things.

One of the wonderful things was the carpool program, which gave us national prominence, as people from all over the country carpooled their institutions, using software developed by **Mark Frank**, one of our 17-year-olds.

We applied for some research grants to help get more computers. The Atari board of advisors have given us a grant to study how to use the Atari computer in the high school environment. To do this, they have given us 20 computers and we have put together this magnificent laboratory. Today we are showing them what we have done with their computers.

Narrator: **David Gottner** is a sophomore at GWHS. This past year, he began programming using the computer language Basic and, for the last three months, has been experimenting with graphic animation. Here, he demonstrates a new animation technique to members of the Atari board of directors.

Gottner: What I did here is I'm plotting black dots that you can't see, I'm using them to give the illusion of real movement. The way I wrote this program, you can elongate galaxies in any angle. I just chose this angle because it's the fastest way. It makes it look like it'll rotate. [Had you been studying astronomy before?] I wanted to be an astronomer and then I met computers and all these programs I'm showing you, I had visions of doing them last year. Now that I've got them done, I'm not going to do astronomy anymore.

[Gottner gets introduced to **Dave Masters**, an animation instructor from Los Angeles] I want to make an object move across the screen.

Masters: I have a program that one of my students did this weekend to demonstrate. We've waiting to get a Gibson light pen and then we can really go to town. It's going to be compatible with the Atari, and you can draw right on the screen. You can do all of this, 89

different patterns to color things in. Infinite amount of colors and blending. But also all of these patterns: dots, cross-hatching, you name it.

Gottner: I seem to find it easier to draw with a formula.

Masters: Well, there's two different ways of approaching it. I have students who are art majors who are into computers and can draw on the screen. With this pen, you don't draw on a table, you draw right on the screen and it stores it.

Gottner: Well, with formulas I can type it into formulas in about 3 or 4 loops(?)

Masters: I have students who aren't artistically motivated, but it's a great ability. You could work with someone else who is artistic and the two of you could work on different ends on the same kind of thing. It really opens it up.

Paul Harris, junior: Drawing a polygon and shows how to fill it up.

Peter Samaras, *senior*: I'm not good on the computer at all, but I like architecture, and I can do architecture on the computer. Say, you want to build a house and you don't know where everything's going to be. When we built our house, my dad had a pretty good idea of where he wanted things. He was trying to explain, well, I want the kitchen over in the back, and the family room on the side. Well, if the architect had a program like this, he could move things around, easily draw the house, move things around with the owner.

Atari person: I could make my room and take walls away and put all of those things, just me. I'm not an architect, I'm not a genius or anything, just to be able to do this. I think you'd have a huge market for this, if you make it very friendly and easy to use.

2nd Atari person: I could have used this when I worked in the library. We were trying to move furniture around, we had to move around heavy bookcases, and take a look at them, and make a floor diagram. I would have loved this.

Steve Kelley is developing techniques to combine 3 separate computer images into one by overlaying them. When done, this could allow a clothes designer, for example, to overlay different parts of a garment in order to visually decide which would work best. It will also allow text lines to be included on the screen at the same time a picture graphic is displayed.

Kelley: I've taken the screen instruction set, the native Atari program, and I've modified it so that it takes part of one screen and goes somewhere else and takes part of another screen and combines the two images into one. This picture will serve as a background to all the others. This is the original. There are 4 other choices. Each one has an entire graphics picture and some text lines.

This is custom screenmaking. They do this for special programs. I've had to do it a number of times for special projects in the school. I'm the only one in the school who knows how to do it, supposedly.

Steve Schecther, *sophomore*: What I did is I signed up for the computer course here because I enjoyed math and also because I wanted to learn about computers. I'd never done anything on a computer before, I'd never touched one. So I joined the program and I enjoyed it very much. When the first semester was over, I went into Computer 2 (which is what I'm in now) and we were given a program called polynomial solutions by integral halving, and what it does is, it finds roots for you by a certain method. And there were some people tried doing it in this language and couldn't get it to work. And I tried and I got very frustrating, and I kept

going at it until I finally made it work. My mother drops me off at school at 6:30 every morning, so I have a chance to use the computers, because the lab is usually fairly packed with students. So she drops me off at 6:30 and then I go through my 6 classes and sometimes I come in after school, so I have some time to work on it some more.

Narrator: The computer application to the field of business is a natural one. **Katie O'Day**, an advanced business student is working with word processing software.

Atari person: I see a misspelling here, so I corrected that.

O'Day: I had to type this letter in a hurry. That's why word processors are great.

Narrator: The computer is an excellent tool for motivating students to stay in school who would have otherwise dropped out. It challenges students to think on their own, to explore and create new answers to old problems. Once students learn some basics, they begin teaching themselves in their own areas of special interest.

Nelda [McKnight] is a senior, enrolled in special education. The computer, a tireless, patient instructor, has sparked new interest in learning.

McKnight: nobody is really perfect. [Is this your favorite game?] The real reason why I really like it is because in the future I believe I will get a job in the computer industry.

Steve Cohen, *junior*: This is a random disc access program written in Forth and this program keeps a list of names and phone numbers that go with the names. And what is really different about this program as opposed to other random disc access programs is that it's written in Forth, which is a new and very powerful language. But not a whole lot of people know about Forth, so I researched it a great deal in a lot of depth and tried to become as much of an expert about it as I could. Then I wrote a manual about it, so that other people could learn Forth from the book that I wrote. I like to adventure with computers. I like to learn something and learn more and more. Once I know it.