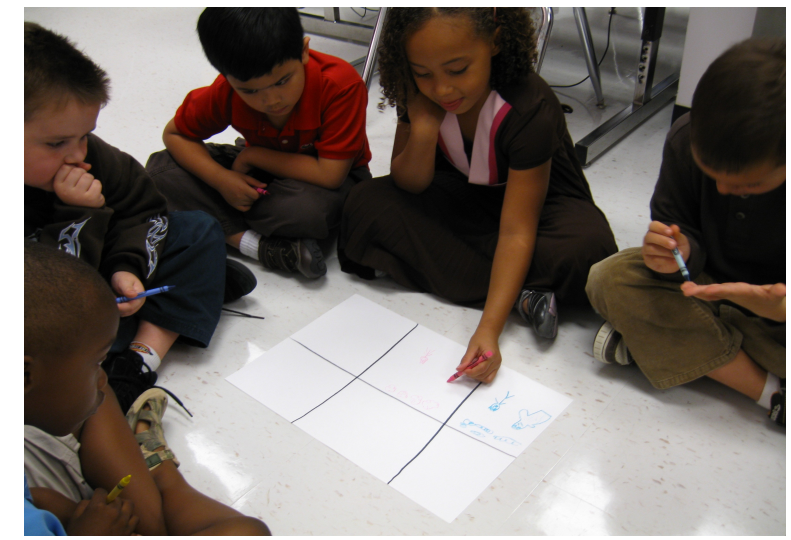




# Benefits of a Computer Education

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#### Abstract

Computer science has become a more integral part of everyday life as technology advances. Because of its importance, a computer science program that uses the programming language Scratch was developed to teach students at Cardinal Forest Elementary School. This project focused its research on whether the computer science education benefited students in ways other than simply gaining knowledge of computer programming. □

#### Procedure

By using Scratch, a program developed by MIT, the students of Cardinal Forest Elementary School will be taught basic computer science skills and problem solving techniques. Each week, curriculum was developed to be taught during the Thursday class sessions. Using the knowledge gained through the curriculum, the children will become more familiar with computer science and will be able to create their own programs. The Scratch program should hopefully influence the student's progress in other academic aspects and in order to measure the amount of benefit the Scratch program has on the children, a survey will be created for the students' teachers to fill out. The survey will measure the students learning style and ability and it will be completed again at several intervals during the year to see if any changes in the child have occurred.

#### Introduction






Does an education in computer science actually benefit young children? Or would they be better off learning more about the subjects that correspond to their core curriculum? By teaching elementary school students basic computer programming skills, they should be gaining something more than just a larger knowledge about computers. The goal of this research project was to investigate exactly what benefits a computer science education provides students and whether a certain type of child benefits more. For example, some children are very shy and prefer to work by themselves, while others are more talkative and willing to ask their classmates for help. Does this computer science program help the shy children learn the value of getting help from their peers, or do the more rambunctious children benefit more because they learn that they need to listen to the teacher's directions?

In order to answer these questions, I have worked with first and second graders at Cardinal Forest Elementary School who participate in a computer science education program. My partner, Crystal Noel, and I developed curriculum for the two classes and taught a thirty minute lesson each week. Throughout the duration of the program, I have studied changes in the children's learning behaviors and I have asked both the teachers and the program mentor, Mr. Allard, to complete a survey to record any changes. □

#### (Expected) Results and (Conclusion)

All types of children participated in the Scratch program this year. However, did a particular type of child benefit more from the program and what were those benefits? It is likely that shy students will benefit the most from Scratch because they will need to learn to work together and ask each other for help. These reserved students will need to go outside of their comfort zone if they want to finish their programs and learn the techniques needed to do so. As the computer class teaches these students the value of teamwork, hopefully they will apply this knowledge in their other classes and it will be evident that they are more open to working with others. Teamwork is a lifelong skill and it is never too early to learn it; if this Scratch program is able to help students benefit in the long run, it will be easier to convince other schools to implement computer courses in their curriculum. The more outgoing students will also benefit from the computer science program because they will learn that, instead of talking when the teacher's talking, they need to listen if they want to learn how to complete their program. As the students begin to understand the importance of listening to directions, they should be able to apply this knowledge to their other classes and they will learn more effectively. Furthermore, as computers become more integral to everyday life and younger children are required to manipulate technology, it is more important for children to learn more about technology. Using computer science, children can learn more about what makes their electronic devices work, and can also learn how to problem solve and manipulate coding to make their program do what they want it to. □

Part 1: Winter Wonderland Project Rubric

Step	Task	Check?
1	Stage: 	
2	Does your snowman have 2 costumes? 	
3	Does your snowman start at x:-100 y:-100? 	
4	Is the snowman wearing the costume that you drew for him?	
5	Does your snowman glide around the ice rink? 	
6	Does your snowman stay on the ice rink? 	
7	<b>Bonus:</b> Does your snowman glide around the ice rink forever?	

The rubric for the Winter Wonderland Project.