Coding in the Classroom

Megan Lee
Grade 3 students will learn coding skills using a variety of activities and programs (i.e., Scratch). As they become more proficient, they will create games/activities using code that allow their Kindergarten buddies to engage in early literacy and numeracy tasks. The overall project will help to further develop communication skills, creative and critical thinking and social responsibility for all involved.
Questions and Hopes

• Will the combination of on-going coding exploration with a target audience in mind help students develop focus, independence and resiliency?

• With consistent encouragement to be creative risk takers, can we get to a place where everyone is engaged in a similar, but individualized task?

• Will experiencing new learning through a grade 3 lens and a K buddy lens help the grade 3’s develop aspects of their core competencies?

• Can grade 3’s participate in, create and teach activities that help K buddies learn early literacy, numeracy and coding skills?
The Participants

Megan Lee: Grade 3 Teacher

Grade 3’s: An energetic, creative and unique group of 8 and 9 year olds. There are 24 individuals with a spectrum of interests and needs.
(3 IEP’s, 1 H designation)

Jodi Johnson: Kindergarten Teacher

Kindergartens: A diverse group of entertaining 5 and 6 year olds. There are 22 early learners with varying personalities and needs

Support from Candy Siegmueller (principal), Rachel Bertles (SBRT) and Josh Vance (district tech)
The Technology

- Smartboard and mounted projector already in classroom
- Document camera already in classroom
- An ipod already in classroom for pictures and Freshgrade
- 11 Macbook Air laptops (with chargers) provided by SET BC (10 student computers and 1 teacher computer)
- A request to our Parent Advisory Council for 2 more laptops to allow for partnering...GRANTED
- Regular sign out access to 30 IBM student laptops (shared between 4 or 5 classes)
- District technology staff did initial set up of computers
An entertainment unit for storage with wheels added for easy movement. This just happened to fit under one of the big tables perfectly.
The Initial Mindset

Overwhelmed, excited, open-minded, unsure

Self-motivated, willing to take risks

An early awareness that the impact of technology in the classroom will be far ranging...everything from storage issues to planning for a “new subject.”

Can we do this with very limited knowledge of coding or any of the related activities and programs?

We believed it would be a team effort to reach our goals and had assigned tasks
SEPTEMBER 16
- Let students know they would be part of an exciting project
- Get SET BC permission forms in from 3’s and K’s
- Talk about storage, charging and handling issues and rules

OCTOBER 16
- Meet with Josh Vance (district tech) to brainstorm starting points
- Start to explore Hour of Code and Light Bot
- Trying “tech-less” coding activities to introduce terms and ideas, especially debugging

NOVEMBER/DEC 16
- Try some grid and arrow coding to practice writing and following code amongst grade 3’s and with K buddies. This involved large grids, random objects and directional language
- Starting to clearly see necessity for thinking through a K lens and the benefits for all that come with doing that.
A few pictures of some of our initial tasks.
January/February
-Cup stack coding with students creating a pyramid and writing a code to match
-Repeating same activity with K audience in mind
-Continually exploring Hour of Code activities and “play” time using Scratch

March/April
-Planning K games with individual skills in mind (coding skills of grade 3’s and early literacy skills for K’s)
-Setting goals and identifying what is realistic
-Time spent independently creating

May
-Final adjustments to games using Scratch experts from grade 4 for help
-Adding/considering small details like a starting message and directions on how to play
## Challenges

<table>
<thead>
<tr>
<th>Student</th>
<th>Teacher</th>
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</thead>
<tbody>
<tr>
<td>Learning proper care/storage</td>
<td>Planning for storage and charging issues</td>
</tr>
<tr>
<td>Consistency with saving procedures</td>
<td>Coding/tech time became like another subject or prep time</td>
</tr>
<tr>
<td>Sharing when ability levels started to vary</td>
<td>Learning curve aligned with that of the students</td>
</tr>
<tr>
<td>Challenging concepts within Scratch for grade 3 (grids)</td>
<td>Team approach became very challenging due to pre-teaching and accessibility of other computers</td>
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<td>Design ideas exceeding abilities</td>
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**Successes**

**Student**
- All students developing some understanding of code and some level of independence
- Numerous students experiencing success with Scratch and the concepts linked to block coding
- Several students stepping up to leadership roles whether it be with the technology or in aspects of the core competencies
- Many students demonstrating resiliency
- Students regularly engaging in meaningful conversations and the problem solving process
- Becoming digital citizens

**Teacher**
- Learning alongside students helped them take risks and critically think (I became a participant/facilitator not the leader)
- Creating a learning opportunity that genuinely involves a level playing field and clear, observable growth
- Authentically addressing various aspects of the new curriculum and the core competencies
- Modeling life long learning, resiliency, risk-taking, critical thinking and problem solving
Evolving Mindset

Technology can help students develop independence and resiliency.

When the teacher genuinely doesn’t know all of the answers, the team can take authentic risks together in a safe environment.

It’s O.K. to try something, recognize and explain that “We aren’t ready for that,” and revisit later. Then we can recognize and celebrate our growth.
Reflections & Recommendations

- Working in pairs and groups has many benefits, but often students needed independent time to play, explore and take risks. This time helped them solidify knowledge and work through misconceptions. Having a variety of group, partner and independent activities will be key to keeping them engaged.

- Spend time on the idea of “de-bugging.” A clear message about mistakes usually being the operator not the computer will encourage students to take ownership of their choices.

- When choosing activities, try to break them down into ALL of the necessary steps for success (opening a file, learning a skill, saving, etc.). Go slow, and build up to all of these parts. Experts will emerge, and the practice will benefit all.

- Use “teacher accounts” whenever possible to simplify things for you and to have access to student’s work.
A link to some of my thinking throughout the project...

http://sd22hillviewcodinginquiry.edu/blogs.org/
## Digital Citizens & Learners

<table>
<thead>
<tr>
<th>Citizenship</th>
<th>Active Involvement</th>
<th>Productivity</th>
<th>Self-Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible handling and care</td>
<td>Participation in generation of ideas</td>
<td>Works independently towards goal</td>
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</tr>
<tr>
<td>Respect other’s privacy and passwords</td>
<td>Participation in lessons/learning</td>
<td>Demonstrates necessary skills</td>
<td>At what level did they demonstrate citizenship, participation and productivity?</td>
</tr>
<tr>
<td>Appropriate conduct and judgement (esp. internet use)</td>
<td>Taking action and the necessary steps to become self-informed</td>
<td>Can follow instructions</td>
<td></td>
</tr>
<tr>
<td>Digital law (9 elements)</td>
<td>Independently seeking answers</td>
<td>Demonstrates stamina (creation, risk taking and de-bugging)</td>
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<tr>
<td>Respectful comments and feedback</td>
<td>Risk taking</td>
<td>Can produce a final product with some/many/most/all required aspects</td>
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<tr>
<td></td>
<td>Willing to “de-bug,” re-visit or re-try</td>
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At what level did they demonstrate citizenship, participation and productivity?

What evidence can they provide or describe?

I created this assessment grid as I went to highlight the key skills that kept emerging as “important.” These skills were consistently needed for success.
At the end of May...

- The students are just putting some final touches on their games. They are hoping to have their K buddies try them out the first week of June and then have a celebration!
- The students, along with myself, are amazed and proud of the learning journey we have been on, and love to think back to our first couple of attempts to use Scratch.
- We are thinking about other ways to incorporate coding into our learning. A few students made an interactive food chain to tie in with our Science unit.

We want to thank SET BC so much for this opportunity to learn together, we loved it!