# Using Chromebooks to Improve Academic Achievement

## Background

Centennial Middle School is located in a predominately Hispanic, low-income community where more than 30% of all individuals under the age of 18 live below the poverty line. The school district is insufficiently funded primarily because of a lack of income from property tax collection in the county. The students underperform on most indicators that the state of Colorado collects, though there are signs of improvement within the district.

The overall identified need for Centennial Middle School is to improve academic achievement, specifically in the areas of content area literacy and mathematics. This grant will reach the needs through purchasing one Samsung Chromebook for each student.

## Need

This grant will reach 50 students. Current enrollment is 16students in each of the three grades served by the school. These numbers may appear different when compared to information from previous years because the district is moving the sixth grade class into the middle school rather than the elementary as it has been classified in the past. Three core instructional staff members work with students

**Data Sources Reviewed**

* District Improvement Plan ([Available Online](https://cedar2.cde.state.co.us/documents/UIP2012/0640-1396.pdf))
* Colorado Growth Model SchoolView ([Available](http://www.google.com/url?q=https%3A%2F%2Fedx.cde.state.co.us%2Fgrowth_model%2Fpublic%2Findex.htm%23%2Fyear-2012%2Fdistrict-0640%2Fschools&sa=D&sntz=1&usg=AFQjCNHfQXIrsGfmH7eDrXKknu3tvPAbhg) [Online](https://edx.cde.state.co.us/growth_model/public/index.htm#/year-2012/district-0640/schools))
* Verbal information from relevant groups (PBIS Team & Parent Coalition)

To collect the necessary data, I first met with the school principal Mr. Garcia. Mr. Garcia was the director of special programs last year and has completed many reports regarding our levels of achievement in the district. He led me to the relevant data sources linked above and informed me of groups in the district that would be sympathetic to my research and collect data. I proceeded to obtain the necessary information from the websites provided and set up meetings with members of the two groups. Information on student attitudes and learning environment was collected through interviews with the district Parent Coalition members and Positive Behavior Integration and Support (PBIS) team leaders.

In addition to the Parent Coalition and the district PBIS team, other groups were involved in the needs assessment process. The administration team was influential in defining the need through itsunique, business-minded, perspective. Additionally, discussions with community leaders, notably two school board members and a county commissioner were also important contributors in determining the needs of the school. Last, and probably the most educational, participating in ongoing conversations with parents has been vital to addressing issues and focusing specific needs in the school.

The overall need was identified early; the district needs to improve academic achievement. The collected data shows that the school has constantly underperformed in academics for the past few years. The average percent of students who were proficient or above on Colorado State assessments between the years of 2007 and 2012 were 21%, 44%, and 29% for math, reading, and writing respectively. These averages are significantly below the state averages during the same period. The most recent unified improvement plan on file shows that adequate yearly progress were reached in both math and reading during 2011, though the graph on page four indicates that reading likely dropped in 2012, while math continued to slowly increase. Through discussions with stakeholders, where these results where shared, four major needs were identified that will lead to improved academic achievement:

* Improving in-class differentiation
* Enhancing home preparation
* Making progress monitoring more useful
* Increasing communication between all parties

Teachers have identified many issues with ensuring lessons were carefully differentiated to meet the needs of all students. Teachers in the district are required to teach many different classes in different subjects. This can account for as many as six different classes to prepare for every day. Creating, or even managing offline resources for this many classes is very time consuming. Teachers do have access to online resources to meet the needs of both above and below students, though it is not feasible to move the entire class to a computer lab so some students can use these resources. The district currently has two complete computer labs available for junior high classes to utilize, but they are shared with both the elementary and high school. A mobile lab cart is also available to the junior high, though teachers explain that their use is limited since many of the computers are unavailable due to either network sync issues or poor power supply. Even if a student can successfully turn on a computer and login, it can take up to 15 minutes to reach a desired resource using mobile lab computers.

Teachers have demonstrated an interest with “flipping” classrooms by sending lectures home with students and working on problem solving in the classroom. Unfortunately, many students do not have a reliable way to view digital lessons. Resources that students do have to view media are varied and digital content is unlikely to work effectively on all devices. If a common device were available to all students, teachers would be able to create content based on the need of their students and allow them to view it at home to prepare for classes, freeing up class time for collaborative projects.

Progress monitoring has historically been focused on grades, which are inherently ambiguous. Both parents and students have expressed interest in having a deeper understanding the strengths and weaknesses of the student and having resources available to help fill in identified gaps. Teachers have experimented with the use of learning management systems to improve progress monitoring, though have found that it was mostly ineffective because students were unable to view results in a timely manner. If access to technology were improved, progress monitoring could become part of a daily routine.

When progress monitoring is improved, a channel for communication between parents, students, and teachers will need to arise. Parents will be able to access improved progress reports and view discussions between teachers and students to ensure teachers are meeting the needs of their student. In addition to communicating about class content, students need to have the ability to communicate their understanding of information to their teachers through a variety of methods other than just written.

The technology that will meet the needs of the district in all of the discussed areas for the lowest cost is a Samsung Chromebook. A Chromebook has a reported six hour battery life and is able to access online resources as well as play and record media.

## Goal

## *Improved achievement in content area literacy and mathematics will reflect increased access to technology.*

## Objectives

***To increase percentage of students at/above proficient in math to at least 50% among middle school students by March 2014.***

***(29% increase over previous six-year average, 18% increase over 2012)***

To improve math proficiency, we will use technology to expand differentiation, provide electronic lecture material for home use, and improve progress monitoring. Teachers have expressed difficulty reaching all students with currently available resources. Increased access to technology through one-to-one Chromebooks will allow a greater variety of differentiation strategies. Using these various differentiation strategies, daily lessons will be capable of reaching all students, from those who have low skill to those who are considered gifted in mathematics. To supplement these strategies, immediate access to a web browser will allow students quick access to a series of remediation digital resources that is being assembled by instructional staff at Centennial. Students who have demonstrated proficiency in their understanding of the content of the unit will explore different application techniques of the information. Another area that has been identified as inefficient is the use of class time to focus on problem solving.

Having access to digital lectures or other various learning activities to learn how to “do” math will provide additional class time for working through real world problems. Much of the instructional time is currently used teaching algorithmic techniques that need to be understood, but could be learned outside of the classroom, if the means were available. Teachers will use screen recording and video editing software, along with the vast library of existing content, to provide lessons that students can work through at their own pace. Class time will then be used to work developing problem-solving skills and developing a deeper understanding of the use of content.

Improving access to assessments will give students a better understanding of their skills within a particular curricular objective and help identify specific areas where they can improve. This will be accomplished through the move to using a learning management system that allows for self-assessments, daily formative assessments, and improved feedback. All middle school teachers will complete a three-hour course designed to make them comfortable managing their classrooms with the learning management system Canvas. Canvas is freely available to teachers and is currently in use in some middle school classrooms, but the minimal access does not allow students to receive feedback in a useful manner. Daily use of technology will increase the ability of students to review their work, discuss discrepancies with their instructor, and set their own goals for mastery.

***To increase percentage of students at/above proficient in writing to at least 50% among middle school students by March 2014.***

***(21% increase over previous six-year average, 18% increase over 2012)***

To improve writing proficiency, we will utilize technology to increase the amount of classroom time used writing, improve feedback to students, and increase student level of comfort when discussing writing. Focusing classroom time on improving writing abilities is vital to improving overall proficiency in writing. This has proven difficult over the past few years since there are many other curricular components to focus on. Providing students with common technology will allow them to review content from a library of collected resources that are currently available. This will free up class time to work on writing rather than going through lecture concerning writing conventions. Along with additional time writing and discussing writing with peers, students will also need better feedback on their writings.

Teachers who focus on writing within their content areas will use the Canvas learning management system for the discussion ability that it provides. After the three-hour training session, teachers will know how to open communication directly on student work. This differs from the traditional method of providing written feedback on paper assessments by the ability for students to respond to feedback directly within the assignment and engage in directed discourse with the evaluator. This is not currently possible due to the technology constraints of the students and time constraints of the teachers. Not only will Canvas minimize the amount of time required to grade a “stack” of papers, it will also provide students with immediate feedback that they cannot throw away or lose as the year goes on.

***To increase percentage of students at/above proficient in reading to at least 60% among middle school students by March 2014.***

***(17% increase over previous six-year average, 21% increase over 2012)***

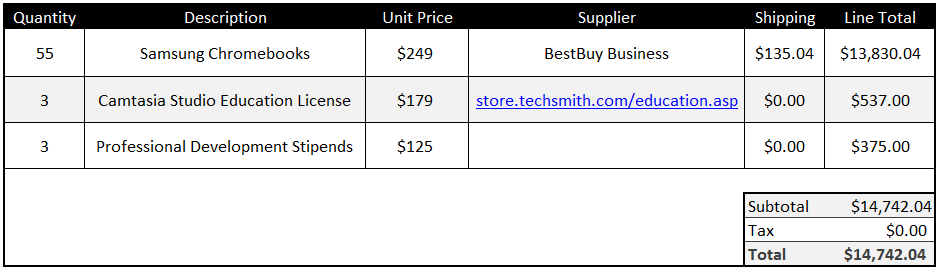
To increase reading proficiency, we will use technology to improve progress monitoring and increase access to digital resources. Instructional teams comprised of teachers in core content areas will create reading comprehension assessments in their content areas and made available on Canvas as they become useful. This will provide a framework for both students and teachers to gain a better understanding of the strengths and weaknesses of the student and focus on improvement. This will also encourage teachers in science and social studies to incorporate reading comprehension into their curriculum. As mentioned earlier, this is not currently possible because most students have little access to technology to review their progress at school.

## Budget

The primary expenditure for this grant is 55 Samsung Chromebooks. This includes one device for each of the 50 students served and five emergency devices that can be deployed while a device is under repair. These devices will be the primary student portal to access assessments and differentiated versions of lessons, and to communicate with teachers and classmates.

Teachers will use Camtasia Studio to create home lecture material and differentiated lessons. The software has multiple sharing capabilities included in the price to ensure availability to all students. One license is required per teacher.

In-class implementation may be difficult, so either one six-hour training or two three-hour trainings will be required for the three teachers who will be using these systems in their classrooms.  The district pays stipends at $125 per day, so one stipend for each teacher would be sufficient.



## Evaluation

### Internal Evaluator

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Grant reporting will use the following criteria to show progress toward and achievement of [goals and objectives](http://edtech.mrooms.org/mod/resource/view.php?id=51359):

* Performance on 2013 TCAP exam in relevant content areas
* Performance on other academic measures including district assessments
* Adequate use of the technology by both teachers and students

### Process evaluation

Activity Evaluation

Purchase equipment Purchase order

and software Delivery receipt

Record of serial numbers

Professional Development Notice of program

Registration and sign-in sheets

Event evaluation form

Expand Differentiation List of available resources

Log of student use

Administrative feedback

Flip Lessons Monitor of classroom time

(Digital Lectures) Measure of access to lessons

Administrative feedback

Improve assessments Record Lessons

through dialogue Example dialogue from teachers/students

### Product evaluation

Activity Evaluation

Professional development Classroom application of strategies:

Observation

Lesson plans

Skills/proficiency tests

Learning:

Student portfolios

Assessment - classroom/standardized

Equipment Utilization

Ease of Access

Resources Availability

Access to special populations

Variety and use

Outcomes Student Portfolios Feedback log

Student performance

### Data gathering methods

Qualitative Quantitative

Classroom observation Student Perception Survey

(Principal & Peer) Parent & Teacher surveys

Assessment Data (Formative &

Teacher logs and lesson plans Summative)

Teacher resources list

Informal discussion % decrease:

Downtime in classroom

% increase:

Scores

Mr. Garcia will continue to gather data regarding assessments and student perceptions as well as monitoring classroom performance and lesson plans. To improve these aspects, teachers will work to include parents in surveys to determine their perception on reaching their students and maintain resource use logs that they will make available to Mr. Garcia. Using this information, we intend to reduce misused time in the classroom and improve student performance on all assessments.

### Assessment instruments

Students will take a student perception survey created by the Colorado Legacy foundation to determine their perception of the classroom environment. Additionally, students will take a series of formal assessments at various times throughout the year to determine academic growth. Additionally, classroom teachers will improve access to formative assessments and provide direct feedback to students.

The school principal will handle classroom observation and lesson plan review. Information is documented using Bloomboard, an online teacher evaluation system. Teachers and the principal will develop a survey to pass on to parents to measure their belief that the needs of their children are being met.

### Data analysis

The principal will collect data and our technology coordinator will prepare it for analysis. Teachers and the principal will review the information informally online for a time period of one week and will have a formal meeting to discuss the results of the surveys and available assessment data. An additional meeting will be held to analyze the data from the state assessment once that information has been released. The present parties will evaluate the success of the program based on the following goals:

* Improve math proficiency to at least 50%
* Improve writing proficiency to at least 50%
* Improve reading proficiency to at least 60%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Evaluation Checklist | | | | |
|  |  |  | **Date Completed** | **File** |
| Process | Purchase Equipment and Software | Purchase Order |  |  |
| Delivery Receipt |  |  |
| Record of Serial Numbers |  |  |
| Professional Development | Notice of Program |  |  |
| Registration Sheet |  |  |
| Sign-in Sheet |  |  |
| Evaluation forms |  |  |
| Expand Differentiation | List of available resources |  |  |
| Logs of student use |  |  |
| Administrative Feedback |  |  |
| Flip Lessons | Monitor of classroom time |  |  |
| Measure of access to lessons |  |  |
| Administrative Feedback |  |  |
| Improve Classroom Discourse | Record Lessons |  |  |
| Example Dialogue |  |  |
| Product | Professional Development | Observation |  |  |
| Lesson Plans |  |  |
| Skills/proficiency Tests |  |  |
| Student Portfolios |  |  |
| Assessment Results |  |  |
| Equipment | Utilization Logs |  |  |
| Ease of Access |  |  |
| Resources | Availability Logs |  |  |
| Access to Special Populations |  |  |
| Variety and Use Documentation |  |  |
| Outcomes | Student Portfolio Reviews |  |  |
| Feedback Log |  |  |
| Assessment Results |  |  |

Completed by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Parent / Guardian Survey

1. **Using the Chromebooks has helped my son/daughter improve academically**

Strongly Agree

5

4

3

2

Strongly Disagree

1

Comments:

1. **My son/daughter is more willing and able to communicate with classmates, parents, and teachers about schoolwork.**

Strongly Agree

5

4

3

2

Strongly Disagree

1

Comments:

1. **Using the newly available technology, my son/daughter is more aware of their progress in their classes.**

Strongly Agree

5

4

3

2

Strongly Disagree

1

Comments: