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Coding Club

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NEBRASKA HONORS PROGRAM

CLC EXPANDED LEARNING OPPORTUNITY CLUBS

INFORMATION SHEET

Name of Club: Coding Club

Age/Grade Level: Middle School

Number of Attendees: (ideal number)
20

Goal of the Club: (learning objectives/outcomes)

The goal of the club is to plant and nurture interest in computer science and programming.

Resources: (Information for club provided by)

Chrome Books, a Projector, HDMI cord

Content Areas: (check all that apply)

- ☐ Arts (Visual, Music, Theater & Performance)
- ☐ Literacy
- ☒ STEM (Science, Technology, Engineering & Math)
- ☐ Social Studies
- ☐ Wellness (Physical Education, Health, Nutrition & Character Education)

Outputs or final products: (Does the club have a final product/project to showcase to community?)

Each participant will showcase a game they created at the end and everyone will have a chance to play each other's games.

Introducing your Club/Activities:

For the very beginning of the club, ask about some of the students' favorite video games. This discussion will lead into how they can and will make their own in this club. For regular club meetings, ask students about their week and maybe a question relating to the main topic for the day.

General Directions:

Once students have settled in, give a general overview of the day's lesson and go over what will need to be included in the project for the week. If students feel that they know enough about the topic to work on their own without further instruction, they are able to start on their project. However, they will need to show an instructor a finished project that follows the outlined expectations at the end of the club meeting. After the lesson, students will start a project that utilizes the tools taught in Scratch that day. At the end of the club meeting, students will publish their project so that the instructors can see them and comment on them later. Ask students to give a thumbs up, thumbs sideways, thumbs down for how they think the session went. Students may share something they liked or didn't like.

Tips/Tricks:

It is advantageous to have experience in Scratch before starting this program. Play around with it and create a few things in order to get familiar with the software.

Have a set number of extra challenges each day to give to students that are further ahead. This is so that the advanced students are engaged but regular students aren't left behind.

Look through all students' projects and leave (for the most part – positive) feedback on them. This will help them learn what they did right and what can be improved next time.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Lesson 1: Introduction to Club and Scratch
Length of Activity:	60 min
Supplies:	Any computer that can run Scratch (http://scratch.mit.edu/) and a way to project a club leader's computer screen so club members can easily see it.

Directions:

Begin the session with asking the students how their day was. Give a short introduction and discuss the goals and expectations of the club. (Suggested expectations: Paying attention when asked to, no phones, no doing anything on chrome books besides working on designated game, and most importantly being respectful to everyone's ideas and work). Afterwards go around the room and have everyone say their name, grade, and favorite video game.

Once introductions are finished, explain a little bit about what Scratch is and what it does. After, ask a show of hands of who has heard of and/or used Scratch before to better gauge the students' abilities coming into the club. Then, ask students who have experience with Scratch what they have made in the past. Show the students how to sign up for Scratch. The students who already have an account will only need to login to their current account.

Conclusion of the activity:

Once students have created accounts and/or logged in, write down the usernames of each student's account so the projects they publish can be seen by instructors in the future. If there is any extra time, show some examples of projects created on Scratch to demonstrate its capabilities.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name:	Lesson 2: Dance Animation
Length of Activity:	45 min
Supplies:	Any computer that can run Scratch (http://scratch.mit.edu/) and a way to project a club leader's computer screen so club members can easily see it.

Directions:

Demonstrate how to use the sound, looks, and motion features in Scratch. To do this, create a "dance animation" by creating a Sprite that has at least 2 different poses (aka costumes), adding

blocks that cause the Sprite change poses every .5 seconds as well as move from side to side (using the “move x steps” block), adding blocks to play music during the animation, and finally, adding a background. Then have students will switch to making their own dance animation. Their animation must have the above features, but are not limited to them.

Challenges for students: have multiple dancers, switch the sound part way through, and/or make a story having characters walk around on the screen and have a conversation before dancing.

Conclusion of the activity:

Give a short summary about what was learned during the club meeting, then ask for feedback.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name:	Lesson 3: Clicker Game
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Length of Activity:	45 min
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Supplies:	Any computer that can run Scratch (http://scratch.mit.edu/) and a way to project a club leader’s computer screen so club members can easily see it.
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Directions:

Demonstrate how to use the events, variable, and control features in Scratch by making a clicker game. To do this, first add a balloon as sprite. Second, add blocks to make the balloon appear at a random point on the screen every 5 seconds. Additionally, have the balloon change color every time it changes location. Third, add blocks so that if the balloon is clicked on, a “pop” sound will play and the balloon will “hide” for one second. Fourth, add blocks so that a variable called “score” will increase by one every time the balloon is “popped” Finally, create multiple duplicates of the balloon.

Give students a chance to play the example game and switch to letting them create their own clicker game. Each game will need to have multiple sprites that disappear when clicked and reappear in a random location. Student may also create a different style of game that uses the same tools shown in the lesson instead.

Challenges for students: create a clicker game with different characters, have the objects glide across the screen instead, use the space bar to pop something that is at the certain point in the screen instead of the mouse, and/or use the space bar to shoot a laser out of a spaceship to destroy aliens.

Conclusion of the activity:

Give a short summary about what was learned during the club meeting, then ask for feedback.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name:	Lesson 4: Chase Game
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Length of Activity:	45 min
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Supplies:	Any computer that can run Scratch (http://scratch.mit.edu/) and a way to project a club leader's computer screen so club members can easily see it.
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Directions:

Demonstrate how to use the operators and sensing functions by making a chase game. To do this, first add two sprites: one that will be chased and one that does the chasing. Then, add blocks to make the chasing sprite follow the mouse and blocks that will make the chased sprite move away from the chasing sprite whenever it gets close. Finally, add blocks that end the game if the chased sprite is touched by the chasing sprite.

Give students a chance to play the example game and switch to letting them create their own chase game. Each game will need at least 2 sprites (one that chases and one that is chased) and sensing/operator blocks so that sprites can tell when they're near to something or need to follow it.

Challenges for students: create treasure hunt game where sprites must get close to a clue to reveal it, add multiple sprites that can be chased, and/or have a timed game where the player tries to catch as many sprites as possible

Conclusion of the activity:

Give a short summary about what was learned during the club meeting, then ask for feedback.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name:	Lesson 5: Intro to Final Project
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Length of Activity:	45 min
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Supplies:	Any computer that can access google docs and a way to project a club leader's computer screen so club members can easily see it.
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Directions:

Re-introduce the ultimate goal of the club and the final project: building a game in scratch.

Explain to students that they will need to make a plan before starting their game and figure out what the theme of their game will be, the objective/mechanics, who the player character is, and

whether or not points will be scored. Then share a worksheet through Google Docs that allows students to fill in blanks with the information they need to plan out their game. In addition to the above requirements, the worksheet should also include space for how the students will go about designing their game, as well as space for a second game idea.

As students finish, have them share their worksheet with the instructors. Then give student feedback and suggestions on their idea for their game. If there is any extra time, students may start working on their games and/or instructors may demonstrate some games that have been created on Scratch. Students are welcome to explore Scratch to get ideas, but they must not copy someone else's game and they cannot start on their own until they have the worksheet filled out.

Conclusion of the activity:

Ask some students to share their ideas for a game with everyone. Then, ask for feedback on the meeting.

Parts of activity that worked:

Parts of activity that did not work:

**Lesson Activity
Name:**

Lesson 6: Making a Main Character

Length of Activity:

40 min

Supplies:

Any computer that can run Scratch (<http://scratch.mit.edu/>) and a way to project a club leader's computer screen so club members can easily see it.

Directions:

In order to help students get a better idea of where to start, the next few weeks will be a step-by-step to creating a game. Each week will build on the previous one, with the end result being a full game. For the first week, character design, including designing the actions for the player character, will be demonstrated. Using Scratch, show students how to design different costumes for sprites (such as one for jumping or talking). Additionally, show how to create different ways of moving the character (such as arrow keys or moving the mouse).

Students will have the rest of the time to work on their games.

Challenges for students who complete their game early: create a flappy bird inspired game, make a pong inspired game, and/or add more special effects/levels to their existing game.

Conclusion of the activity:

Ask students about their current progress in making their games and if there's anything that they want to specifically go over next week. Then, ask for general feedback about the session.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name:	Lesson 7: Creating Levels
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Length of Activity:	40
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Supplies:	Any computer that can run Scratch (http://scratch.mit.edu/) and a way to project club leader's computer screen so club members can easily see it.
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Directions:

This week, demonstrate how to make levels. Create blocks for the character to jump up and stand on, add code to make the blocks move, and even show how to make multiple “worlds” (such as moving on to a different level when a player touches the edge of the screen)

Students will have the rest of the time to work on their games.

Challenges for students: (In addition to the ones from the week prior) make an old school style alien shooter game.

Conclusion of the activity:

Ask students about their current progress in making their games and if there's anything that they want to specifically go over next week. Then, ask for general feedback about the session.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name:	Lesson 8: Adding Points, Obstacles, and Lives
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Length of Activity:	30 min
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Supplies:	Any computer that can run Scratch (http://scratch.mit.edu/) and a way to project club leader's computer screen so club members can easily see it.
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Directions:

This week will focus on adding a score, obstacles, and lives. To do this, review how to add a score system (as gone over in Lesson 3: Clicker Game). Then, create a sprite that will act as a stationary obstacle (such as spikes). Add the blocks necessary to give the player “lives” (using a similar system as points) and make the life variable go down when the player touches the spikes (use the sensory feature).

Students will have the rest of the time to work on their game.

Challenges for students: (In addition to the ones from the week prior) work on the other game idea (from the worksheet Google Doc)

Conclusion of the activity:

Ask students about their current progress in making their games and if there's anything that they want to specifically go over next week. Then, ask for general feedback about the session.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name: Lesson 9: Adding Enemies

Length of Activity: 45 min

Supplies: Any computer that can run Scratch (<http://scratch.mit.edu/>) and a way to project club leader's computer screen so club members can easily see it.

Directions:

For this week, demonstrate how to add enemies to the game. To do this, add a sprite and add the blocks needed to have them walk back and forth across the screen. Then, add blocks that allow the enemy sprite to sense when the player is near/they are touching the player. Review how to make a player "lose a life" after touching an enemy (same system as obstacles) If there is time/enough interest, show students how to give their character a way to defeat enemies (such as a fireball).

Students will have the rest of the time to work on their games.

Challenges: See previous weeks' challenges

Conclusion of the activity:

Ask students about their current progress in making their games and if there's anything that they want to specifically go over next week. Then, ask for general feedback about the session.

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Name: Lesson 10: Finishing Touches

Length of Activity: 45 min

Supplies:

Any computer that can run Scratch (<http://scratch.mit.edu/>) and a way to project club leader's computer screen so club members can easily see it.

Directions:

This week will focus on adding final touches/special effects. Demonstrate this by adding sound effects (such as an "ouch!" when a player gets hurt or a "ding!" when coins are collected), hearts that disappear when the character loses lives, a "game over" or "congratulations!" screen at the end of the game, etc. Time will be given to students so they can ask to see something they want demonstrated in order to help them develop their game.

Students will have the rest of the time to work on their games. This is the final week that will be given for work time.

Challenges for students: See previous weeks' challenges

Conclusion of the activity:

Ask students about how they feel about their (hopefully) finished game. Then, ask for general feedback about the session.

Parts of activity that worked:

Parts of activity that did not work:

**Lesson Activity
Name:**

Lesson 11: Present and Play

Length of Activity:

45 min

Supplies:

Any computer that can run Scratch (<http://scratch.mit.edu/>)

Directions:

Have half of the students present their game (the other half will present the next week). Have each student give a two minute presentation about their game and how to play it. Once presentations are finished, students will be given the chance to play any of the student-made games. Have students switch to a different game every 5-10 minutes so they can experience a wide variety of games.

Conclusion of the activity:

Give students a chance to share what they liked or thought was cool about other students' games. Wrap up by congratulating everyone who shared their games on their efforts!

Parts of activity that worked:

Parts of activity that did not work:

Lesson Activity Lesson 12: Present and Play

Name:

Length of Activity: 45 min

Supplies: Any computer that can run Scratch (<http://scratch.mit.edu/>)

Directions:

Have the other half of the students present their game. Have each student give a two minute presentation about their game and how to play it. Once presentations are finished, students will be given the chance to play any of the student-made games. Have students switch to a different game every 5-10 minutes so they can experience a wide variety of games.

Conclusion of the activity:

Give students a chance to share what they liked or thought was cool about other students' games. Wrap up by congratulating everyone who shared their games on their efforts during the club. Thank all club members for their participation and wish them a great rest of the year!

Parts of activity that worked:

Parts of activity that did not work:
