Lesson Plan Title: Ozobot Iditarod Mapping and Coding

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Discipline / Subject: Technology

Topic: Ozobot Iditarod Coding

Grade Level: 2-8

Resources / References / Materials Teacher Needs:
- Ozobots for coding
- Ozobot coding sheets
- iMovie app
- Enlarged Iditarod Maps traced onto butcher paper - 1 per group

Lesson Summary:
- Before starting the lesson, students should practice making codes independently and honing the color coding skill
- make an original map by projecting the map onto a smartboard/wall and taping a piece of giant butcher paper to trace
- Have a parent volunteer copy the map/that year's race route for each group

- Begin the lesson by explaining the purpose of the lesson - to create your story of the Iditarod on a large map using an Ozobot as a team
- Students are broken into teams to plan out which checkpoints they will select to use – I would not recommend more than 4 students/group
- Students then research the checkpoints and learn about the route, checkpoints and different aspects of the race they may be unfamiliar with
- They then are asked to come up with different actions that the Ozobot can perform that would make sense with things that might happen along the race (ex. zig-zag as slipping on ice, or pause for 3 sec. to show a mandatory rest)
- After they plan the actions and stops, they use the Ozobot coding sheets to draw a code directly onto the trail map
- Once this is done, they use a sharpie to color in the rest of the trail map a solid black for the Ozobot to follow
- Students then come up with a script of what they are going to say into the video in a reader's theater/play "script" format
- Then groups begin to then test the Ozobot, to make sure it is correctly performing the commands and makes it the entire length of the trail
- Students can then decorate around the map – making sure pictures are not too close to the codes or black line
- After it is working consistently, groups then begin rehearsing for filming

- Once they are satisfied with their preparation, they begin using the iMovie app (or equivalent) to film their bot running the course – they can also use the camera feature then upload their video to the iMovie app to add effects and music
- These are then presented to the class and the teacher (for assessment)

Standards Addressed: (Local, State, or National)

1) Ohio Technology Standards:
   a) Information and Communications Technology The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.
      i) Topic 1: Identify and use appropriate digital learning tools and resources to accomplish a defined task.
         (1) With guidance, identify and use digital learning tools or resources to support planning, implementing and reflecting upon a defined task.
      ii) Topic 3: Use digital learning tools and resources to construct knowledge.
         (1) Interpret images, diagrams, maps, graphs, infographics, videos, animations, interactives, etc. in digital learning tools and resources to clarify and add to knowledge.
         (2) Create artifacts using digital learning tools and resources to demonstrate knowledge.
      iii) Topic 4: Use digital learning tools and resources to communicate and disseminate information to multiple audiences.
         (1) Produce and publish information appropriate for a target audience using digital learning tools and resources.
   b) Design and Technology Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.
      i) Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.
         (1) Describe a process as a series of actions and how it is used to produce a result.
      ii) Topic 2: Identify a problem and use an engineering design process to solve the problem
         (1) Generate, develop, and communicate design ideas and decisions using appropriate terms and graphical representations.

Learning objectives:	Assessment:
Students will be asked to use a minimum number of checkpoints from the Iditarod race to plan, write a script and produce a code for their Ozobot to perform to complete the race	- Viewing the video of the Ozobot coding, the teacher will be able to determine the success of the team - Observation of groups to assess understanding of content and technology - Reviewing the script of the team will allow the teacher to assess depth of understanding of the checkpoints and Iditarod race

Procedural Activities
1. Students will need some practice with ozobots prior to starting this activity - specifically coloring the codes accurately and testing them on a designed track
2. Students will need to be shown the capabilities and restrictions of the ozobots beforehand
3. Students will need ample space (floor) for maps - depending on size

Materials Students Need:
- Ozobots & chargers
- iPads or other filming devices
- iMovie or similar app
- Large outline of the Iditarod course for that year (and multiple copies for each group)
- Paper to write scripts
- Markers to code the map and decorate upon completion
- Ozobot coding sheets
- Iditarod.com for the map and list of checkpoints

Technology Utilized to Enhance Learning:
- Ozobots & charges
- iPads or other filming devices
- iMovie or similar app
- Iditarod.com for the map and list of checkpoints to pull information from
- Possibly "Garage Band" app for enrichment/extension

Other Information
- Students will be broken into teams for this lesson - I recommend assigning teams rather than let students choosing

Modifications for special learners/ Enrichment Opportunities
- Differentiating this activity can be done by adjusting the number of checkpoints and difficulty of codes selected by each group
  - Higher ability groups can be challenged to include more checkpoints
  - Lower ability groups can be asked to include fewer checkpoints
- The depth of the required scripts can also vary depending on the ability of the group
- Tech savvy students may also use the "Garage Band" app to create their own music to use in their video

Notes:
- Students can design a sled to be placed on top of the Ozobot as a challenge activity
- Students can decorate the rest of the map by drawing landforms or other places of significance

The Iditarod Trail

Scan the QR Code to watch our Ozobot follow the trail.

Cole, Addison, Sienna, and Triztan's Ozobot Trail	Gabby, Presley, Thaddeus, and York's Ozobot Trail	Olivia, Danny, Sebastian, Maya, and Chloe's Ozobot Trail
Erin, D'Angleo, Mila and Brody's Ozobot Trail	Maggie, Matthew N., Matthew R., and Joe's Ozobot Trail	Payse, Cayden, Alison, MJ, and Raelyn's Ozobot Trail

Next pages are the Ozobot planning pages for student use (copy & distribute):

Ozobot planning page - Choose 5 Checkpoints (min.)

Checkpoint - South	Code/Event
Anchorage	
Willow	
Rainy Pass	
Nikolai	
Ophir	
Iditarod	
Grayling	
Kaltag	
Unalakleet	
Shaktoolik	
Koyuk	
Nome	
(Other)	

Ozobot planning page - Choose 5 Checkpoints (min.)

Checkpoint - North	Code/Event
Anchorage	
Willow	
Rainy Pass	
Nikolai	
Ophir	
Ruby	
Galena	
Kaltag	
Unalakleet	
Shaktoolik	
Koyuk	
Nome	
(Other)	

Color code reference chart

OzoCodes

ozobot

SPEED

SNAIL DOSE
FAST
SLOW
TURBO
NITRO BOOST
CRUISE

DIRECTION

GO LEFT
U TURN
LINE JUMP LEFT
GO STRAIGHT
LINE JUMP STRAIGHT
U TURN (LINE END)
GO RIGHT
LINE JUMP RIGHT

TIMERS

TIMER ON (30 SEC. TO STOP)
TIMER OFF
PAUSE (3 SEC.)

COOL MOVES

TORNADO
ZIGZAG
SPIN
BACKWALK

WIN/EXITS

WIN/EXIT (GAME OVER)
WIN/EXIT (PLAY AGAIN)

COUNTERS
FIVE DOWN TO STOP

ENABLE X-ING COUNTER
ENABLE TURN COUNTER
ENABLE PATH COLOR COUNTER
ENABLE POINT COUNTER
POINT +1
POINT -1

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