

Series: M³: Making My Move Lesson #3: Which Way Do I Go?

Teacher and Student Editions

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The School Career Resources (SCR) "Making My Move" is a series of five lessons developed for 5th to 8th grade students based on career pathways to help them begin to think about career opportunities. Each lesson utilizes the construction of an aircraft-related project to engage the students in career decision making. Each of the five lessons build off one another, so it is important to do them in sequence. However, if time is only available for one lesson, the first lesson is the most important. Each lesson can be taught by any teacher or school counselor; no prior knowledge is needed to successfully deliver the content. Lessons could be taught in transitional classes, classes where students are introduced to careers, homeroom sessions, classes that would involve students conducting self-reflection, social studies classes, etc. Honestly, this series of lessons could be taught in any upper elementary or middle school class, at any time. Each lesson was designed for one class period, but since they provide a rich context for elaboration, you may want to consider planning for two or more hours.

SCR 1: This lesson uses the construction of a hot air balloon as the vehicle for instruction and as a visual representation of student potential. In this lesson, students will explore their abilities and interests in the context of where they can go.

SCR 2: This lesson uses a dirigible or blimp as the vehicle for instruction and as a visual representation that careers can be selected and guided. In this lesson, students will explore how their abilities and interests can help them consider career areas; it is not intended that students will pick a career at this time. Rather, students will see how a plan is valuable for achieving goals.

SCR 3: This lesson uses the construction of a model of an antique airplane as the vehicle for instruction and as an example of skills and interests. In this lesson, students build a model airplane and plan an imaginary trip in it, drawing their flight path on a road map or an aeronautical sectional chart. Students "fly" the airplane on a string to experience that it can be controlled. The activities in this lesson provide a context to identify likes, dislikes, and skills, so students see how their personal beliefs lead to the identification of an appropriate career cluster.

SCR 4: This lesson uses a jet as the vehicle for instruction and as a visual representation of going fast, high, and far. This lesson was designed to help students in grades 5-8 expand their thinking about what is possible. Students build a model jet aircraft and decorate it to reflect their interests and values. Students fly the jet using a rubber band-powered launcher and adjust the control surfaces for a successful flight path. The activities in this lesson lay the foundation for a focus on matching careers to personal values, interests and goals. When an occupation/job is chosen based upon one's interests and values, passion, enthusiasm, and resiliency will be there for developing a successful, fulfilling career.

SCR 5: This lesson uses a rocket as the vehicle for instruction and as a visual representation of doing extraordinary things. Students design and build the rocket and then test it for stability before launching. Students also build a tracking device and use it to calculate the apogee (highest altitude). Students compare the tasks they completed in this activity to characteristics they feel employers need. Finally, students match employability skills with career clusters consistent with their interests.

Completing the lessons in the SCR "Making My Move" series will help to meet two Illinois PaCE (Postsecondary Career Expectations) requirements in the 8th grade individual learning plan:

- 1. complete a career cluster survey
- 2. complete a unit on education planning

See <u>https://www.isac.org/pace/documents/pace-framework.pdf</u> for additional information. In addition to helping meet the PaCE requirements, the SCR lessons address several Illinois Priority Learning Standards in English Language Arts, Mathematics, Physical Science, and Social Emotional Learning areas.

Lesson Overview:

This is the third of a series of five lessons designed to help students in grades 5-8 think about possible careers. In this lesson students work in pairs to build a model airplane and plan an imaginary trip in it, drawing their flight path on a road map or an aeronautical sectional chart. They "fly" the airplane on a string to experience that it can be controlled. These activities lay the foundation for a focus on one or both of the following:

- 1. Identify likes and dislikes, skills and challenges that guide the use of career cluster information.
- 2. Address career pathways.

Classes or Discipline:

- Transitional classes
- Career based classes (i.e. Intro to Careers)
- Any class or subject involving self-reflection or planning for the future
- Social Science, Math, ELA, Science

Career Cluster:

• This lesson is applicable to all <u>CTE Career Clusters</u>

Illinois CTE Endorsement Area:

• This lesson is applicable to all <u>CTE Endorsement Areas</u>

Grade Level(s):

• 5th-8th grades with special distinction towards more developed 7/8th grade concepts in the elaboration portion of this lesson.

Anticipated Days/Minutes: Approximately two or three 50 minutes class periods. This could be considerably longer if several academic standards are addressed.

Learning Objectives:

At the conclusion of this lesson and activities, students will be able to:

- Use their abilities and interests to identify what it means to "cluster".
- Explain how skills can be identified today and how they might apply those skills to careers in the future.

Standards Addressed--dependent upon the subject in which the lesson is immersed:

- <u>Priority Learning Standards</u>
 - English Learning Arts Grades 5-8
 - (Written Expression 1) Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
 - (Reading Informational Text 3) Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
 - (Reading Informational Text 4) Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
 - Social Emotional Learning Standards (SEL)--Priority Standards Grades 6-8:
 - <u>Goal 1</u>(IELDS GOAL 30): Develop self-awareness and self-management skills to achieve school and life success. 1A.3b. Apply strategies to manage stress and to

- motivate successful performance.
- <u>Goal 2</u> (IELDS GOAL 31): Use social-awareness and interpersonal skills to establish and maintain positive relationships. 2B: Recognize individual and group similarities and differences.
- <u>Illinois Social/Emotional Standards:</u>
 - <u>Goal 1</u>: Develop self-awareness and self-management skills to achieve school and life success.
 - Recognize personal qualities and external support.
 - Stage I--1. Identify possible career and volunteer opportunities based on your identified interests and strengths.
- American School Counselor Association (ASCA) Standards
 - Mindset Standards:
 - M2: Self-confidence in ability to succeed.
 - M6: Positive attitude toward work and learning.
 - Behavior Standards
 - <u>Self-Management Skills (B-SMS)</u>:
 - B-SMS 1: Demonstrate ability to assume responsibility.
 - B-SMS 2: Demonstrate self-discipline and self-control
 - B-SMS 3: Demonstrate ability to work independently.
 - Social Skills(B-SS):
 - B-SS 9: Demonstrate social maturity and behaviors appropriate to the situation and environment.
- Illinois WorkNet Postsecondary & Career Expectations (PaCE) Student <u>Checklist</u>
 - \circ $\;$ Identify potential careers you are interested in.
 - Explore career clusters.

Essential Employability Skills. There are four <u>essential employability skills</u>

- Personal Ethic: integrity, respect, perseverance, positive attitude
- Work Ethic: dependability, professionalism
- Teamwork: critical thinking, effective and cooperative work
- Communication: active listening, clear communication

The focus of this lesson is on integrity, positive attitude, and active listening.

Skill	How it is addressed:
Integrity	Completing the survey should be done with integrity. They shouldn't rush through the process or fear getting an answer wrong as that is not possible.
	Students should be honest and do the best that they can to answer all questions truthfully.
Positive Attitude	This activity is about self-exploration. Adolescents can struggle with their identity and this is a good way to allow them to understand that everyone has a talent and a skill they can be proud of.
Active Listening	The building of the machine as well as the engage activity focus on good listening skills.

Enduring Understandings:

• Students will know how to apply their personal interests while building a potential list of career ideas.

Resources and References:

Please make sure you have the career cluster survey results available for the Elaborate section of this lesson. If you are not able to get them back online at this time, you can continue with the lesson by noting the "No technology available" portion of that section. The best connection to these results will be made if they can access their previous scores.

Each airplane requires the following:

- 1. A piece of cardboard about 16" long and 12" wide. All parts can be cut from one side of a copy machine paper box.
- 2. 12 oz empty, clean and dry soda can
- 3. 1 sheet of construction paper (8 ¹/₂" x 11")
- 4. Cardboard scissors or tin snips
- 5. Craft stick (optional)
- 6. Tape (clear or masking)
- 7. About 6' of string but may be longer depending on the activity selected.
- 8. One or two paper clips
- 9. Ruler
- 10. Pen/pencil to make cutting marks
- 11. Markers/colored pencils, etc. to decorate if desired
- 12. Compass

Most of the parts held together with tape would work much better with glue. Hot-melt or Cool-melt glue is best since it holds quickly. Tacky Glue is also an option. Tape is more readily available, safer, and less messy.

Classroom will require:

- 1. State road map or aeronautical sectional charts for each pair of students.
- 2. Colored pencils
- 3. Handout or access online to:

CTE Career Cluster information Career Pathway information <u>Career Interest Survey - Pictorial Version</u> <u>Pictorial Interest Inventory</u>

- 4. Task Checklist handout on the last page of the lesson.
- 5. Student access to the career website used in Lesson #2 (<u>Illinois Career Information System</u>). As a reminder; if you had students sign in individually they can use the same sign in with this lesson. Some schools have a group account so you may have access to the login information. Working with your administration or school counselor might be helpful to secure your student's login info. Many school districts use other career exploration programs such as Xello, Major Clarity, Naviance or Illinois WorkNet. Your school/career counselor will be helpful in matching the goals of this lesson with progress of the school's career exploration program.

Suggested Differentiation Strategies:

- Using partners or working in small groups.
- Writing notes, paraphrasing, or using pictures are all acceptable.
- Some students may need help cutting and taping. Be careful, however, that they need help, and are not acting helpless.
- The airplane project allows room for creativity. Some students will be uncomfortable with choice and claim to not know what they are supposed to do. In many cases, exactly what to do is rather flexible and many options will all work out fine. Provide support as necessary but avoid telling them what to do.
- Working with the map requires scale measurement. Some students will understand this quickly and do it accurately. Others will not. Watch for students allowing others to do it for them and intervene as necessary.
- The following 3 bullet points will be referencing the Illinois Career Information System:
 - The only way to not succeed in this activity is to not do it. There is an online version with two different levels of the picture version of the assessment. The online version can be read aloud for readers who struggle with vocabulary.
 - The simple vocabulary with the pictorial version can be printed and used with students who have a variety of language challenges. That model can be found here: <u>Career Interest Inventory -- Pictorial Version</u>
 - The picture only version is also available. These would need to be scored by hand but the information is all located here. <u>Pictorial Interest Inventory</u>

Throughout this lesson, suggested teacher notes and comments are in red.

1. Engage: (10 minutes)

Four Corners:

- 1. Look at the 4 corners of your classroom. Your teacher has placed a sign with the numbers 1, 2, 3 and 4 in each corner.
- 2. Stand up.
- 3. Your teacher is going to read a question and then tell you four possible answers. Listen closely.
- 4. Go to the corner of the answer that you choose.

Read these questions and possible responses one at a time. Allow students time to move to the corresponding corner.

- A. Of these 4 colors, which do you prefer?
 - 1. Red
 - 2. Yellow
 - 3. Blue
 - 4. Gray
- B. What is your favorite season?
 - 1. Spring
 - 2. Summer
 - 3. Fall
 - 4. Winter
- C. Of these 4 Animals, which do you prefer?
 - 1. Cat
 - 2. Dog
 - 3. Horse
 - 4. Snake
- D. My favorite subject is...
 - 1. Language Arts
 - 2. Math
 - 3. Science
 - 4. PE
- E. If you could vacation in one of these places, which would you pick?
 - 1. Hawaii
 - 2. California
 - 3. Canada
 - 4. England
- F. If you could travel across country, would you do so by...
 - 1. Bus
 - 2. Train
 - 3. Plane
 - 4. Car
- G. If you had to get to the location you picked from question E which direction would you travel?
 - 1. North
 - 2. South
 - 3. East
 - 4. West

- H. How sure are you that you know the correct answer from question G?
 - 1. I have no idea
 - 2. I am pretty sure
 - 3. I am 100% sure
 - 4. What was question E?
- 5. When finished, return to your seat. Your teacher is going to ask you a few questions about what you just did.

Ask these questions and encourage students to think about the answers.

Tell me about this activity.

- 1. Did you notice anything?
- 2. Did you move with the same students? Why? What does that tell you about these students?
- 3. Do you think most questions were easy to answer?
- 4. Had you ever thought about some of the questions?
- 5. Were there any that were hard to answer?
- 6. Why do you think we did this activity? What did you learn by doing it?
- 6. Sometimes getting to know yourself is challenging. Sometimes making decisions about your interest and your likes and dislikes are hard, even if they aren't necessarily decisions that really don't mean much in the end. In this lesson, we are going to do a project and then use it to help us learn about ourselves.

2. Explore: (20 minutes)

Work in pairs to build an antique airplane:

This activity can be modified to take as little as 20 minutes if the parts are pre-cut and all tools and materials are readily available. Working in pairs will greatly reduce the quantity of materials, but since they are very inexpensive, that may not be an issue. Some aspects of this project will require more than one set of hands. You may encourage the students to document their progress as they make their airplanes by taking photos and/or video.

Make the Fuselage:

1. Set a compass to 8".

Students can simply form a cone and cut it to shape but using the compass to draw an arc of a specific radius is a valuable skill.

2. Put the point of the compass in the middle along the long edge of a piece of paper and draw an arc.

There are two ways to easily find the middle of the long edge. First, students can simply fold the paper in half and crease the center. Do not, however, crease it all the way across. This will deform the cone. The other is to measure the length (11") and cut that in half (5 $\frac{1}{2}$ "). Using mathematics as a tools is always a good idea.



3. Draw a straight line from the place where the point of the compass was placed and where the arc goes off the paper on each edge.

This line does not have to be perfectly straight, but the ability to draw along a straight edge will be useful later.



- 4. Cut out the arc and straight sides and roll it into a cone. The cone will probably start as a tube but encourage them to continue working with it to form a cone.
- Adjust the size of the cone until the bottom fits nicely on top of an aluminum soda can. It will be easier if the cone is slightly larger than the diameter of the can. If the base of the cone is a bit too large it can be folded along the sides of the can and taped down.
- 6. Tape the side of the cone together and then tape it to the top of the can. Try to get it straight. This is one task where a second set of hands will be helpful.



Make the Wings:

 Cut two pieces of cardboard to 3" wide by 14" long. These will be the wings. You might want the top wing to be a bit longer, maybe 16 inches. Often the top wing is longer than the bottom wing on these old airplanes. The wings are initially rectangles. Students may wish to modify the wing shape once they

The wings are initially rectangles. Students may wish to modify the wing shape once they understand how this airplane model goes together. A cardboard scissors or tin snips works well. Also, a utility knife is an option since all cuts in this model are straight. A utility knife, however, might pose a safety issue for the student and the desktop or floor.



2. Set the soda can in the middle of the bottom wing and draw a straight line up both sides of it starting on the back edge of the wing. These lines should go halfway across the wing. Students should measure to find the center of the wing. They could also measure the diameter of the can and divide it in half to determine how far each cut should be from the center line. They can also "eyeball it" and probably be close enough. If they are too far off center, the airplane will not "fly" correctly.

3. Cut the slots from the back edge of the wing halfway across. The slots are only cut to the midpoint of the wing. They are not cut all the way across. Since the wings are 3" wide this cut should be 1 ½" long. Calculating this measurement provides practice with fractions.





Make the Landing Gear:

- 1. Cut a piece of cardboard into a rectangle that is 3" wide by 5 ½" long. Make two of them. It would be possible to provide a pattern to be traced, but that eliminates the mathematics.
- Place a mark 1" in from the edge along the bottom.
 It does not matter which side but should be along the short edge of the rectangle.



- 3. Draw a line all the way across the rectangle 2 ½" up from the bottom edge. This line is used twice.
- 4. Draw an angled line from the 1" mark to the end of the line at 2 ½". Here again students draw along a straight edge.
- 5. Cut the angled line. This should pose no problem.
- 6. Cut a slot from the straight edge along the line at the 2 ½" mark halfway across. Since the rectangle is 3" wide this cut should be 1 ½" long.





Trace it on the other rectangle to make two pieces.
 If the cardboard has a "good side" and a "bad side" encourage students to make both a left and a right piece.

Assembly of wings, landing gear, and fuselage:

 Slide the landing gear into the slots on the bottom wing. They will fit tight so students may need to make the slots slightly wider. If they were not accurate when cutting the slots, the edges of the landing gear will not align with the edges of the wing. Fortunately, cardboard is inexpensive and new parts can be made.



2. Place the fuselage between the two pieces of cardboard on top of the bottom wing and tape it all together securely. The end of the cone should line up with the back edge of the wing. The bottom end of the soda can will stick out a short distance from the front edge of the wing. It now begins to look like an airplane.





- 3. Bend the landing gear legs out slightly. If students study photos of antique aircraft, they will see that the land gear legs usually angle out.
- Tape the top wing to the top of the cardboard sides. The top wing on these old airplanes is usually forward of the bottom wing. You can cut off the extra cardboard in the back. It doesn't really matter how the wings align, but in most cases the top wing is a bit larger and is slightly ahead of the lower wing.



Struts and dihedral:

- Cut two rectangles that are 1" wide by 3" long.
 A few students will realize that the struts look better if they angle forward.
- Tape the struts between the wings near the ends (but not on the ends). The precise location does not really matter, but they usually look best at about 1 ¹/₂" in from the wing tips of the lower wing.
- It looks best and flies best if the wings angle up slightly.
 Both wings can be carefully bent so the tips are about 1" above the center. This will make the model look more realistic and will be a bit more stable in flight.



Tail:

- Look at photos of old airplanes and cut a rudder from cardboard any shape you want. It should be about 3" by 3" but it could be a little bit smaller. The shape of the rudder and elevator is up to the students. Of course, rectangular will be easier to draw and cut.
- 2. Draw it on cardboard and then cut it out.



- 3. When it looks right, tape it to the top of the cone in the back. Some students will struggle with getting this taped on securely and straight. It is also possible to cut the point off the cone for about ½" and then cut a slot in the top of the cone. Insert the rudder into the slot and flatten the sides of the cone against the rudder. Staple it together. This method may work better but is not as easily modified.
- The left and right sides of the elevator should each be about 3" by 3" but can be just about any shape you think looks best.
 Students are likely to make the tail surfaces too small.
- 5. Tape them to the left and right sides of the cone by the rudder. This could be done by making the elevator one piece and cutting a slot halfway across the elevator and rudder, assembling the parts just like the landing gear and wings earlier.



Propeller:

- 1. A craft stick makes a great propeller, but one can be cut from cardboard. A cardboard propeller can be cut to shape and twisted.
- 2. Tape the propeller to the front of the fuselage. Since the bottom of the can is concave, it will probably be taped to each side. Glue might be a better option.

Decorate:

1. Look at photos of old airplanes. Draw engine cylinders, a cockpit, numbers, or anything else that would make your airplane look great.

An internet search will provide many examples of biplanes.

- 2. Feel free to modify your airplane or take it home and make a better one. Modifications will take as much time as allowed.
- 3. Soda bottle caps work great for wheels and a bamboo skewer makes a great axle. Many of your students will find this project exciting and fun and will probably spend hours at home modifying this airplane and building others.
- You will probably want to cut the wing tips to the right shape and maybe draw control surfaces on the wings and tail.
 Some modifications are quick and easy while others will require rebuilding.



Fly it:

- 1. Tie a long string around the middle of the top wing.
- 2. Slide this string around until the airplane hangs level. Then tape it securely. The airplane must balance level to "fly" properly.
- It is a good idea to put additional tape on the wings and tail. Be sure they are straight and secure. Also, the airplane has to be held together securely or it might come apart in flight. That is never a good thing.
 This will place some force on the wings, if they are not attached securely, they will come off.
- 4. Stand in the middle of a large, open area and slowly swing the airplane around you. It should eventually point forward. If it does not, the tail surfaces are probably too small, or the string is not at the balance point of the plane. It may not start out straight but should straighten as the flight continues. If necessary, a few pennies or other small weights can be added to the front of the airplane to make it more stable.
- As your airplanes flies better, you can let out more string, so it is flying in a larger circle. Just be careful not to hit anybody or anything.
 Of course, some immature students will see this as an opportunity to crash their planes, either

into solid objects or into each other. Don't allow it.

Another option for "flying" the airplane is to tie a string near the floor on one end of the classroom and allow students to hold the other end high. Attach a paper clip to the upper wing of the airplane and slip it over the string. The airplane will slide down the string and can be guided to a perfect landing. It may be necessary to attach a second paper clip to the top of the rudder to keep the plane stable and straight. A fun idea would be to make a runway on the floor out of construction paper or cardboard. Lights would be a nice feature.

6. When you are done, help your teacher hang your airplane from the ceiling of your classroom. Hanging the airplanes from the ceiling provides several advantages. First, they are out of the way and not taking up precious classroom space. Also, they can easily be seen, but not touched by everyone. Finally, if they are hung from horizontal strings, they can be moved to indicate some type of race.

Where to go:

It is important to plan a trip with the airplane to provide students experience with a completely different activity utilizing a different set of skills. The planning, however, can be minimized to picking one destination and drawing the flight path. It can also be greatly enhanced by researching the speed of the airplane, fuel consumption for each leg of the trip, and calculating ground speed based on current wind conditions. Students may record their data in any form that you prefer. Their itinerary could be in a chart you create or one that the students create. It can also be in a journal format, and/or electronically recorded in a spreadsheet.

1. Get a map from your teacher. This will be either a state road map or an aeronautical section chart.

Road maps are available through the department of transportation or can often be picked up at a rest area. Providing a variety of states would make this activity more diversified and interesting, but also means they will not begin or end their trip at home. Aeronautical Sectional Charts can be purchased for under \$10 each, but since they are only good for 6 months, often pilots and airport managers have outdated charts that cannot be sold. The charts are preferable for this activity since students are probably already familiar with road maps.

- Pick a location where you will be starting. This might be your hometown, but maybe somewhere else.
 Their starting location is based on the boundaries of the map or chart.
- 3. Identify 3 or 4 other locations on your map where you would like to go. On the sectional chart, the airports are clearly identified. On the road map, assume that most every town has an airport where you can land a small plane.

To reduce the time required for this activity, simply assign fewer locations.

4. Use a pencil and a ruler to draw a straight line between all your destinations starting and ending at your "home base." This is called your "flight path." Since you are flying, you do not need to follow roads.
It works best to draw on the map. If the maps must be used again, tracing the locations on another sheet of paper is possible. Also, students could tape a string to the map. Going straight from one point to another will be a bit odd to them since they are not accustomed to flying.

- 5. Use the scale on the map to determine the number of miles of each leg of your trip. Write the distance along the line. This step provides a great opportunity to apply mathematics concepts. It can be omitted. The ideal way to do scaling is to set dividers at the distance indicated on the map scale and "walk" them along the flight path. A ruler can be made from a piece of paper that is the same length as the map scale. Another way is to measure the length of the map scale and the length of the flight path line.
- 6. Add up the distances.

If students know the ground speed of the airplane and the fuel consumption (usually in gallons per hour) they can calculate time and fuel use. This provides additional experience using mathematics for "real world" problem solving.

- 7. The straight line will be the shortest and fastest way to get from one location to another. It might not be the most fun, the most interesting, or perhaps even possible. The concept of a straight line and a "round-about" path is introduced here as an analogy to be used later when addressing career preparation.
- 8. Look to both sides of your flight path to see if there is anything close-by that you would like to fly over. Also, check out your flight path to see if there is any restricted airspace that you cannot enter. Usually private planes are not allowed near very large airports or near military bases.

Restricted airspace is clearly and very overtly identified on sectional charts. It can only be assumed on road maps. Assume that you cannot fly over a military base or important government building (the White House, for example).

- 9. Adjust your flight path to account for these deviations using a different color pencil.
- 10. Estimate the distance of each leg of the trip and total them up. Getting an accurate distance is probably not worth the time it will take to do so. A close estimate will be fine.

3. Explain: (10 minutes)

- 1. Your teacher has a checklist for you that identifies all the tasks you did when building the airplane and marking the flight path. Go through the list and mark each one.
 - 1. Like Very Much
 - 2. Like
 - 3. Not sure
 - 4. Dislike
- 2. Using several different colored pencils, shade in the rows on the checklist that are similar tasks. For example, cutting the paper with scissors and cutting the cardboard wing are very similar. They would be in the same cluster of tasks.
- 3. Based on your checklist, what cluster of things do you like to do? Students may record their responses in any form that you choose. You can have students respond on the checklist, orally or continue their thoughts on the itineraries they created.
- 4. Based on your checklist, what cluster of things do you dislike doing?

5. Write an example of when you knew exactly what you wanted to do and went straight toward it.

This question may require some explanation, if it is used at all. A reasonable example would be to save money specifically to buy a certain product. This question starts the process of thinking about career pathways. You may need to provide additional examples.

- 6. Write an example of a time when you had a goal or target but took a "round-about" way to get to it. Initially students may be thinking too literal about this. Perhaps they walked around a mud puddle rather than straight through it. Another example would be that they save money, but don't yet know how it will be spent. Help them to apply this concept to abstract ideas if
- possible.7. How does your straight path and "round-about" path relate to your career?
- An example may be helpful. Perhaps teaching is a second or third career for you. It is rare for a person to select a career in middle or high school and continue that same pathway for decades.

4. Elaborate/Extend: (15 minutes)

If you have computers or internet available:

If the students have access to their scores from the survey from the last session, they should have seen a chart that looks like a variation of this.

Allow them to sign back in or use your (or a generic) account to click around if they need to see a visual of the sign in process again.

If you are using a different career exploration program/tool then have students look at their suggested careers based upon their interests and skills surveys. The next step is having the students explore their career clusters and pathways and those careers, taking note of how many years of college or training after high school to be prepared for the career of their choice.

- 1. Sign in to your Illinois Career Information System account.
- 2. Click on your name in the top right-hand corner. You will see this screen



- 3. Click on the "More" in the bottom left corner,
- 4. You should see this screen.

Sort and Assessment Results

View items saved to your portfolio. Delete items you no longer want to keep and edit your thoughts about items you do want to keep.



- 5. Click on the career cluster inventory (I have two saved, you probably only have 1!)
- 6. You should see this screen.

Career Cluster Inventory	🗲 Career Cluster	Career Cluster Inventory		
My Saved Career Cluster Inventory Answers	My Thoughts	Updated	Edit Delete	
Restore Answer Set 2		5/13/2020	e 🖄	
Restore Answer Set 1		1/15/2020	è 🗊	

- 7. Click on the Restore Answer.
- 8. Click Continue. and you should see the bar graph.

CAREER CLUSTER INVENTORY

? Help & Tutorials		≓ Español		🖨 Print
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Career Clusters	<u>Score</u>
Arts, Audio/Visual Technology, and Communications	10
Education and Training	10
Government and Public Administration	10
Health Science	10
Law, Public Safety, Corrections, and Security	10
Architecture and Construction	8
Business Management and Administration	8
Finance	8
Human Services	8
Hospitality and Tourism	7
Science, Technology, Engineering, and Mathematics	7
Agriculture, Food, and Natural Resources	6
Transportation, Distribution, and Logistics	6
Marketing	5
Manufacturing	2
Information Technology	0

This is where it gets even more interesting! Pick a category-most of you might like. You can click the category with the highest score, but-you don't have to! You will see a screen like the one below and you can click on any of the links on the left to explore all the different career clusters!

They may want more direction but just allow the students to explore the links that come up as they go through the different clusters. There are videos they can watch if the bandwidth will allow. Decide what amount of time will be appropriate to examine this in class. This is something they can take home with them as well to explore further if time is limited. Perhaps 5-7 minutes will be sufficient to at least see what the links have to offer.

🕿 USING JUNIOR WHO J	WHERE AM I GOING?	HOW DO I GET THERE?	MY CIS PORTFOLIO	Search	٩
Ipations FAQs Cluste	rs Index Titles Index	Search			
UCATION AND TRAINING					Print
Topics	Overview				
Dverview	Career clusters help you r work. You can use career	elate what you study in m clusters to learn more abo	iddle school and high scho ut your interests. You can	ol to future also use them	
What Would I Do in this Cluster?	to make career plans. The take in high school. When	you create your course pl	s can help you decide wha an for high school, be sure	t courses to you take all	
What Skills Do I Need for this Cluster?	the courses you need to g	raduate.			
What Courses Would I Take in High School?				U	Video
What Activities or Hobbies Would I Be Involved in During High School?					
How Much Do Occupations in this Cluster Pay?					
What Would I Study in College?					
Related Information					
Occupations					
Videos					

- 9. Did you notice anything interesting?
- 10. Are you seeing any connections?
- 11. Did you learn anything new?

There are a lot of ways to look at what a career cluster can mean to a student at this point. The most basic idea is that they are seeing a pattern between tasks they like, and skills involved in a type of career. They can look at activities, skills, interests, and job possibilities in this section. Give them time to find out something interesting that they might not have realized before!

No Technology available: Career Clusters

NEXT STEP: Particularly for 7th and 8th grade students, you may want to invite your School/Career Counselor and/or a CTE teacher from high school to share what pathways and courses are available in grades 9-12.

Career Pathways

When you drew the flight path on the map in the Explore section of this lesson, you found that the shortest way to get to where you were going was a straight line. But you probably wanted to fly around a bit to see other things, even though that was not the fastest way to go. That is how it works with careers also. Yes, there is a "straight line" from where you are now to the career you want as an adult. You can make a list of exactly what classes you should take and what you should do to properly prepare for a job. Very few people ever do that, however. Usually people go one direction for a while until something more interesting comes along. Then they change paths. Just like the flight path for the airplane trip, however, it is good to have a plan, but you don't have to stick to it.

1. Click on the "Where am I going" tab at the top of the page and select the "Education and Training" link.

- 2. Read through the questions listed on the left sidebar of the page and select several of them to learn more about preparing for your career.
- 3. Compare your airplane and map activity to the list of things you liked and are good at doing. Compare them to the Career Cluster Inventory and the careers that fit into those categories. How do they all line up?
- 4. What classes should you sign up for in high school?

In this section there is also the ability to look at projected salaries, classes they can take in high school, and majors that might coincide with their skills in college. These ideas are one step beyond what younger students might be ready to consider. This information offers a variety of additional topics that could be discussed:

- social studies: the current job market and jobs in the news
- math: cost of living, cost of college debt vs income
- science: green jobs, jobs in technology
- language arts: How can I impact the world? What is important to my community?

Write it down:

After reviewing your career cluster inventory, write a paragraph or more stating your opinion on various careers and how they align to your interests. Support your point of view with reasons and information. You may wish to explain why you would consider some careers and completely reject others.

Encourage the students to be a detailed as possible. The written paragraphs are not all that critical, but the cognitive process required to write them is very valuable. They will have to seriously consider various careers and compare them to their interests and abilities.

5. Evaluate:

Your teacher may use the following rubric to assess your project and understanding of the material in the lesson.

(3) Exceeds Expectations/ Accomplished	(2) Meets Expectations/ Competent	(1) Developing Toward Expectations
The student followed technical context carefully and diligently to complete the antique airplane project.	The student followed most of the directions within the technical context with a few minor errors and completed the antique airplane project.	The student followed a few directions within the technical context and was unable to completely finish the antique airplane project.
The student helped by encouraging and assisting others while problem solving during construction, while considering other students' suggestions.	The student tried other students' suggestions while problem solving during construction without being a distraction of others.	The student tried but had some difficulty solving problems during construction OR did not take an opportunity to help others and may have been a distraction to others.

The student exceeded the number of required locations and easily identified them on the map, accurately measured and calculated distances and times.	The student met the number of required locations on the map after assistance. Measurements and calculations had minor mistakes.	The student's attempts in mapping locations were not clearly identified OR distances were not measured in scale OR time was miscalculated.
The itinerary and career interest paragraphs were neat, easy to read, accurate, reasonable, and detailed.	The itinerary and career interest paragraphs were written well, missing minor details or accuracy.	The itinerary and/or career interest paragraph was completed but with several missing components.
During the process of completing the cluster checklist and reviewing their Career Cluster Inventory, the student chose a few careers that matched their interests and skills.	After completing the cluster checklist, the student identified personal interests and skills that were included within careers suggested in their chosen Career Cluster Inventory.	The student did not complete the cluster checklist and/or did not access the Career Cluster Inventory.
This student made the connection between planning a trip and planning a life.	The connection between planning a trip and planning a life was prompted after discussion with the instructor.	This student struggled to see the connection or was unable to make the connection between planning a trip and planning a life.
The student was self-directed and took this lesson seriously, putting forth exceptional effort and a positive attitude.	The student focused on the task and needed guidance to be successful.	The student chose not to participate at times and needed to be reminded to return to the task.

Handout:

Task Checklist:

Like Very	Like	Not	Dislike	Task
Much		Sure		
				Setting the compass and drawing out the cone on the
				construction paper
				Cutting the paper with scissors
				Forming the cone and tape it to the soda can
				Measuring out the wings on the cardboard
				Deciding if both wings will be the same size or if one is larger
				Cutting the cardboard wings
				Measuring to be certain the soda can is in the middle of the
				lower wing.
				Measuring and drawing the pattern for the landing gear
				Getting the slots the right size so that the landing gear will fit
				nicely on the wing.
				Attaching the fuselage to the wing
				Figuring out where to place the top wing
				Drawing, cutting, and installing the struts
				Bending the wings for some dihedral
				Researching photos of antique airplanes
				Selecting an airplane that you want to model
				Drawing the pattern for the tail surfaces (rudder and elevator)
				Figuring out what to use for a propeller and how to fasten it to
				the front of the fuselage.
				Decorating the airplane
				Modifying it or making a new airplane
				Figuring out what control surfaces should be drawn on the
				wings and tail.
				Flying the airplane on a string
				Locating places on the map or chart
				Trying to figure out what at least some of the symbols, colors,
				and numbers are telling you on the map or chart
				Picking out fun or interesting locations to visit
				Using a straight edge to draw the flight path
				Figuring out the length of each leg of the trip using the proper
				scale
				Studying the map or chart for interesting things to see that
				would be near the flight path
				Calculating the total distance of the flight, the time, and the fuel
				consumption of the airplane. (if your teacher had you do it)
				Reading and following directions
				Trying to figure out what to do by studying the photos
				Working with a partner
				Helping another person
				Showing somebody else how to do something
				Figuring out how to use specific tools

Sticking with it until the project is finished
Being creative
Making the project look nice
Adjusting the airplane to make it fly better
Arranging the airplanes hanging from the ceiling to make the
display look better
Solving problems
Fixing mistakes
Add, subtract, multiply, and divide numbers
Communicate effectively with your teammates
Working safely
Making decisions
Compromise with your teammates

Notes:

All ILCTE lessons are vetted by: Curriculum Leader, Dr. Brad Christensen.

To see a review of this lesson by previous users, please <u>click here</u>.

We invite users of this lesson to <u>click here</u> to leave follow up information and rating. We would like to publish pictures/videos of your students using this lesson. Please send to Rod McQuality at: rdmcqua@ilstu.edu. By sending pictures, you have met all picture/video release for your school.

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M³: Making My Move Lesson:

#3 Which Way Do I Go?

Student Edition

Lesson Overview:

This is the third of a series of five lessons designed to help students in grades 5-8 think about possible careers. In this lesson students work in pairs to build a model airplane and plan an imaginary trip in it, drawing their flight path on a road map or an aeronautical sectional chart. They "fly" the airplane on a string to experience that it can be controlled. These activities lay the foundation for a focus on one or both of the following:

- 1. Identify likes and dislikes, skills and challenges that guide the use of career cluster information.
- 2. Address career pathways.

Learning Objectives:

At the conclusion of this lesson and activities, students will be able to:

- Use their abilities and interests to identify what it means to "cluster".
- Explain how skills can be identified today and how they might apply those skills to careers in the future.

Enduring Understandings:

• Students will know how to apply their personal interests while building a potential list of career ideas.

Essential Employability Skills:

There are four <u>essential employability skills</u>

- Personal Ethic: integrity, respect, perseverance, positive attitude
- Work Ethic: dependability, professionalism
- Teamwork: critical thinking, effective and cooperative work
- Communication: active listening, clear communication

The focus of this lesson is on integrity, positive attitude, and active listening.

Skill	How it is addressed:
Integrity	Completing the survey should be done with integrity. You
	shouldn't rush through the process or fear getting an
	answer wrong as that is not possible. Be honest and do
	your best to answer all questions truthfully.
Positive Attitude	This activity is about self-exploration. Everyone has a
	talent and a skill they can be proud of.
Active Listening	The building of the machine as well as the engage activity
	focus on good listening skills.

Resources and References:

Each airplane requires the following:

- 1. A piece of cardboard about 16" long and 12" wide. All parts can be cut from one side of a copy machine paper box.
- 2. 12 oz empty (clean and dry) soda can
- 3. 1 sheet of construction paper (8 ¹/₂" x 11")
- 4. Cardboard scissors or tin snips
- 5. Craft stick (optional)
- 6. Tape (clear or masking)
- 7. About 6' of string but may be longer depending on the activity selected.
- 8. One or two paper clips
- 9. Ruler
- 10. Compass
- 11. Pen/pencil to make cutting marks
- 12. Markers/colored pencils, etc. to decorate if desired

Classroom will require:

- 1. State road map or aeronautical sectional charts for each pair of students.
- 2. Colored pencils
- 3. Handout or access online to:

CTE Career Cluster information Career Pathway information <u>Career Interest Survey - Pictorial Version</u> <u>Pictorial Interest Inventory</u>

- 4. Task Checklist handout on the last page of the lesson.
- 5. Student access to the career website used in Lesson #2 (<u>Illinois Career Information System</u>). As a reminder; if you had students sign in individually they can use the same sign in with this lesson. Some schools have a group account so you may have access to the login information. Working with your administration or school counselor might be helpful to secure your student's login info. Many school districts use other career exploration programs such as Xello, Major Clarity, Naviance or Illinois WorkNet. Your school/career counselor will be helpful in matching the goals of this lesson with progress of the school's career exploration program.

<u> 1. Engage:</u>

Four Corners:

- 1. Look at the 4 corners of your classroom. Your teacher has placed a sign with the numbers 1, 2, 3 and 4 in each corner.
- 2. Stand up.
- 3. Your teacher is going to read a question and then tell you four possible answers. Listen closely.
- 4. Go to the corner of the answer that you choose.
- 5. When finished, return to your seat. Your teacher is going to ask you a few questions about what you just did.
- 6. Sometimes getting to know yourself is challenging. Sometimes making decisions about your interest and your likes and dislikes are hard, even if they aren't necessarily decisions that really don't mean much in the end. In this lesson, we are going to do a project and then use it to help us learn about ourselves.

2. Explore:

Work in pairs to build an antique airplane:

Make the Fuselage:

- 1. Set a compass to 8".
- 2. Put the point of the compass in the middle along the long edge of a piece of paper and draw an arc.



3. Draw a straight line from the place where the point of the compass was placed and where the arc goes off the paper on each edge.



- 4. Cut out the arc and straight sides and roll it into a cone.
- 5. Adjust the size of the cone until the bottom fits nicely on top of an aluminum soda can. It will be easier if the cone is slightly larger than the diameter of the can.
- 6. Tape the side of the cone together and then tape it to the top of the can. Try to get it straight.



Make the Wings:

1. Cut two pieces of cardboard to 3" wide by 14" long. These will be the wings. You might want the top wing to be a bit longer, maybe 16 inches. Often the top wing is longer than the bottom wing on these old airplanes.



- 2. Set the soda can in the middle of the bottom wing and draw a straight line up both sides of it starting on the back edge of the wing. These lines should go halfway across the wing.
- 3. Cut the slots from the back edge of the wing halfway across.





Make the Landing Gear:

- 1. Cut a piece of cardboard into a rectangle that is 3" wide by 5 ½" long. Make two of them.
- 2. Place a mark 1" in from the edge along the bottom.



- 3. Draw a line all the way across the rectangle $2\frac{1}{2}$ " up from the bottom edge.
- 4. Draw an angled line from the 1" mark to the end of the line at $2\frac{1}{2}$ ".
- 5. Cut the angled line.
- 6. Cut a slot from the straight edge along the line at the 2 $\frac{1}{2}$ " mark halfway across.





7. Trace it on the other rectangle to make two pieces.

Assembly of wings, landing gear, and fuselage:

1. Slide the landing gear into the slots on the bottom wing.



2. Place the fuselage between the two pieces of cardboard on top of the bottom wing and tape it all together securely. The end of the cone should line up with the back edge of the wing. The bottom end of the soda can will stick out a short distance from the front edge of the wing.





- 3. Bend the landing gear legs out slightly.
- 4. Tape the top wing to the top of the cardboard sides. The top wing on these old airplanes is usually forward of the bottom wing. You can cut off the extra cardboard in the back.



Struts and dihedral:

- 1. Cut two rectangles that are 1" wide by 3" long.
- 2. Tape the struts between the wings near the ends (but not on the ends).

3. It looks best and flies best if the wings angle up slightly.



Tail:

- 1. Look at photos of old airplanes and cut a rudder from cardboard any shape you want. It should be about 3" by 3" but it could be a little bit smaller.
- 2. Draw it on cardboard and then cut it out.



- 3. When it looks right, tape it to the top of the cone in the back.
- 4. The left and right sides of the elevator should each be about 3" by 3" but can be just about any shape you think looks best.
- 5. Tape them to the left and right sides of the cone by the rudder.



Propeller:

- 1. A craft stick makes a great propeller, but one can be cut from cardboard.
- 2. Tape the propeller to the front of the fuselage.

Decorate:

- 1. Look at photos of old airplanes. Draw engine cylinders, a cockpit, numbers, or anything else that would make your airplane look great.
- 2. Feel free to modify your airplane or take it home and make a better one.
- 3. Soda bottle caps work great for wheels and a bamboo skewer makes a great axle.
- 4. You will probably want to cut the wing tips to the right shape and maybe draw control surfaces on the wings and tail.



Fly it:

- 1. Tie a long string around the middle of the top wing.
- 2. Slide this string around until the airplane hangs level. Then tape it securely.
- 3. It is a good idea to put additional tape on the wings and tail. Be sure they are straight and secure. Also, the airplane has to be held together securely or it might come apart in flight. That is never a good thing.
- 4. Stand in the middle of a large, open area and slowly swing the airplane around you. It should eventually point forward. If it does not, the tail surfaces are probably too small, or the string is not at the balance point of the plane.

- 5. As your airplanes flies better, you can let out more string, so it is flying in a larger circle. Just be careful not to hit anybody or anything.
- 6. When you are done, help your teacher hang your airplane from the ceiling of your classroom.

Where to go:

- 1. Get a map from your teacher. This will be either a state road map or an aeronautical section chart.
- 2. Pick a location where you will be starting. This might be your hometown, but maybe somewhere else.
- 3. Identify 3 or 4 other locations on your map where you would like to go. On the sectional chart, the airports are clearly identified. On the road map, assume that most every town has an airport where you can land a small plane.
- 4. Use a pencil and a ruler to draw a straight line between all your destinations starting and ending at your "home base." This is called your "flight path." Since you are flying, you do not need to follow roads.
- 5. Use the scale on the map to determine the number of miles of each leg of your trip. Write the distance along the line.
- 6. Add up the distances.
- 7. The straight line will be the shortest and fastest way to get from one location to another. It might not be the most fun, the most interesting, or perhaps even possible.
- 8. Look to both sides of your flight path to see if there is anything close-by that you would like to fly over. Also, check out your flight path to see if there is any restricted airspace that you cannot enter. Usually private planes are not allowed near very large airports or near military bases.
- 9. Adjust your flight path to account for these deviations using a different color pencil.
- 10. Estimate the distance of each leg of the trip and total them up.

<u>3. Explain:</u>

- 1. Your teacher has a checklist for you that identifies all the tasks you did when building the airplane and marking the flight path. Go through the list and mark each one.
 - 1. Like Very Much
 - 2. Like
 - 3. Not sure
 - 4. Dislike
- 2. Using several different colored pencils, shade in the rows on the checklist that are similar tasks. For example, cutting the paper with scissors and cutting the cardboard wing are very similar.

They would be in the same cluster of tasks.

- 3. Based on your checklist, what cluster of things do you like to do?
- 4. Based on your checklist, what cluster of things do you dislike doing?
- 5. Write an example of when you knew exactly what you wanted to do and went straight toward it.
- 6. Write an example of a time when you had a goal or target but took a "round-about" way to get to it.
- 7. How does your straight path and "round-about" path relate to your career?

4. Elaborate/Extend:

If you have computers or internet available:

- 1. Sign in to your Illinois Career Information System account.
- 2. Click on your name in the top right-hand corner. You will see this screen



- 3. Click on the "More" in the bottom left corner,
- 4. You should see this screen.

Sort and Assessment Results

View items saved to your portfolio. Delete items you no longer want to keep and edit your thoughts about items you do want to keep.



- 5. Click on the career cluster inventory (I have two saved, you probably only have 1!)
- 6. You should see this screen.

Career Cluster Inventory

눧 Career Cluster Inventory

My Saved Career Cluster Inventory Answers	My Thoughts	Updated	Edit	Delete
Restore Answer Set 2		5/13/2020	e	Ē
Restore Answer Set 1		1/15/2020	A	圃

- 7. Click on the Restore Answer.
- 8. Click Continue. and you should see the bar graph.

CAREER CLUSTER INVENTORY

Career Clusters	<u>Score</u>
Arts, Audio/Visual Technology, and Communications	10
Education and Training	10
Government and Public Administration	10
Health Science	10
Law, Public Safety, Corrections, and Security	10
Architecture and Construction	8
Business Management and Administration	8
Finance	8
Human Services	8
Hospitality and Tourism	7
Science, Technology, Engineering, and Mathematics	7
Agriculture, Food, and Natural Resources	6
Transportation, Distribution, and Logistics	6
Marketing	5
Manufacturing	 2
Information Technology	0

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Patiens FAQs Cluster	Index Titles Index Search		(0.0m)
JEATION AND TRAINING			e Print
opics	Overview		
Nerview	Career clusters help you relate what work. You can use career clusters to	you study in middle school and high s earn more about your interests. You o	an also use them
What Would I Do in this luster?	to make career plans. The content in career clusters can help you decide what courses to take in high school. When you create your course plan for high school, be sure you take all		
What Skills Do I Need for this luster?	the courses you need to graduate.		
What Courses Would I Take in tigh School?			Video
What Activities or Hobbies Would I Be Involved in During High School?			
low Much Do Occupations in his Cluster Pay?			
What Would I Study in college?			
elated Information			

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No Technology available: Career Clusters

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Career Pathways

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