



THE CRITICAL THINKING

TEACHER'S COMPANION

A Compendium for Developing
CRITICAL THINKING SKILLS



global digital
citizen foundation

What is Critical Thinking?

Critical thinking is clear, rational, logical, and independent thinking. It's about improving thinking by analyzing, assessing, and reconstructing how we think. It's thinking in a self-regulated and self-corrective manner. It's thinking on purpose!

Critical thinking involves mindful communication, problem-solving, and a freedom from bias or egocentric tendency.

You can apply critical thinking to any kind of subject, problem, or situation you choose.

About This Companion

The activity pages and tools inside the Critical Thinking Teacher's Companion are meant to be shared and explored. Use it as an electronic document or as worksheets.

You can either print off the pages and use them as activity sheets, or you can edit them directly right in the document on your computer.

There are also Answer Keys for the activities that need them provided at the back of the book. Now, go get thinking!

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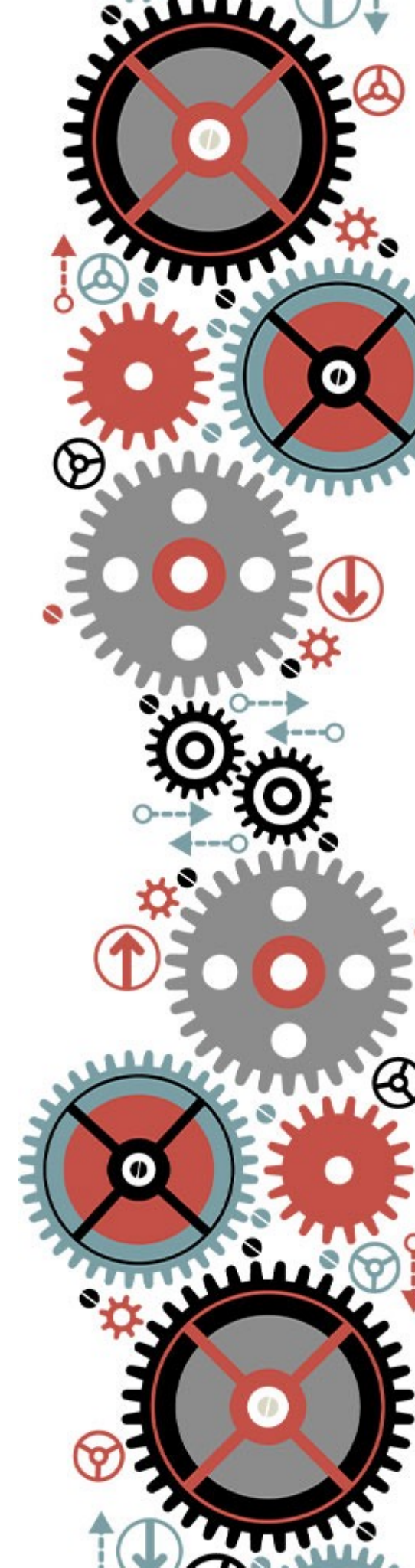
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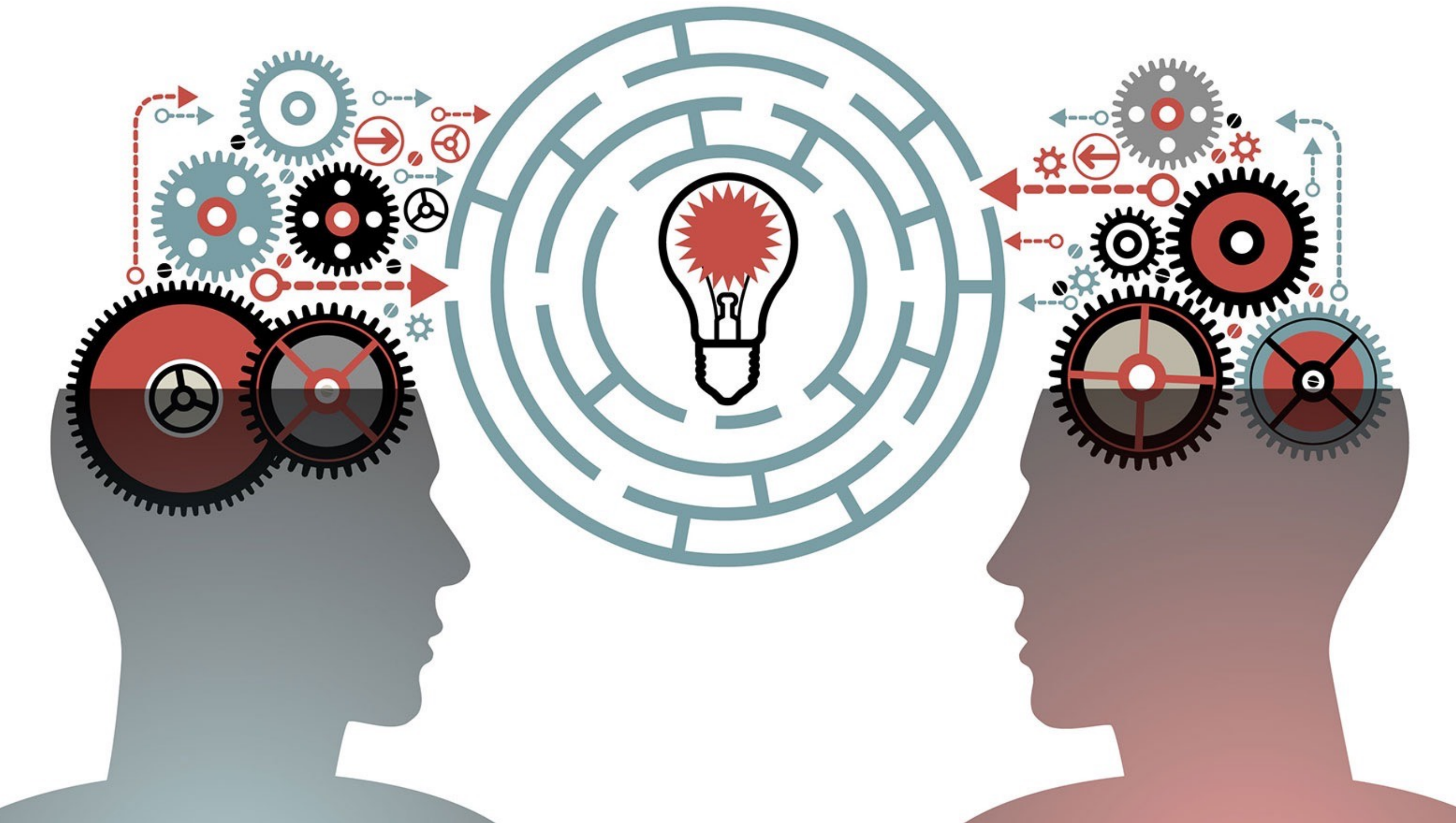
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Activities for

COMMUNICATION



FACT or OPINION?

This exercise is about differentiating between fact and opinion. A **fact** can be *proven either true or false*. An **opinion** is an *expression of feeling or point-of-view* and *cannot be proven true or false*.

The teacher will create some statements that are either fact or opinion. If it's a fact, check on **F** and then briefly explain how it can be proven. If it's an opinion, check on **O** and briefly explain why you feel it can't be proven. Compare answers with your friends and share your views with each other.

Statement:

Reasoning:

1. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
2. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
3. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
4. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
5. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
6. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
7. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
8. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
9. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____
10. _____	<input type="checkbox"/> F	<input type="checkbox"/> O	_____



Use this one for role-playing and interpersonal communication skills. Fill out the character sheet below to create a persona. Next, the class should be given an historical event or current issue related to the lesson to discuss. Students should also get some time to do some research, and to think about how they want to represent their character's views.

The class will split into groups. What follows will be a 20 min. cafe-style conversation about the chosen topic. Be sure to practice things like being open-minded and disagreeing respectfully.

Character Name: _____ Age: _____ Gender: _____ Marital Status: _____

Occupation: _____ Education Level: _____ Hobbies: _____

Create a brief background for your character:

Research notes for your chat:



Work on some skills using metaphor and choosing words carefully with this fun, challenging exercise. Imagine you live in a world where there are **only 10 words you can ever use**. You can repeat them as much as you want, but you *can't ever use any other words*. Write down the 10 words you'd choose.


Next, make sentences with them in order to communicate something to your group. Use feeling and gesture to help them understand you. You can measure their understanding by writing your actual intended meaning below the sentence. Remember, you've only got 10 words to use, so choose them well!

Your 10 words:

Create sentences with them here:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

1. _____
Actual meaning: _____
2. _____
Actual meaning: _____
3. _____
Actual meaning: _____
4. _____
Actual meaning: _____
5. _____
Actual meaning: _____
6. _____
Actual meaning: _____



ALIEN TRAVEL GUIDE

This exercise encourages us to look much deeper at who we are both as individuals and as a society. It's about looking at what we do or what we value with a fresh perspective.

Each activity encourages you to answer the questions as a way of exploring assumptions and some common situations in life that we take for granted. There are 2 scenarios provided. The blank space is so that you can write your own. You can test your fellow classmates with your scenarios in stylized interview sessions where one of you is the alien and the other is the travel guide.

Scenario 1

You are conducting a tour for aliens who are visiting earth and observing humans. You're all in their spaceship when you fly over a football stadium. One of the aliens is confused, and turns to you for help. Try answering these questions:

- What is a game, and why do humans play them?
- What are "teams" and why are they so important for humans to be part of?
- Why is it these games seem to get more attention than other matters on your planet, like disease and poverty?
- Why do humans get so emotional and even violent when watching games?
- What would happen if no human could ever play these games again?

Scenario 2

You are chatting with a group of aliens on a tour of a local library. While you all mingle, one of the aliens picks up a volume about the history of global war and conflict. The alien turns to you and asks you these questions:

- *What is war and why do humans wage it upon each other?*
- *Humans seem to feel that warfare is often the only way to resolve conflict. Why is this so?*
- *How do you decide who wins and who loses? How do you know this is accurate?*
- *How does warfare affect those who can't or won't participate?*
- *What legacy do you feel these wars will provide for your future generations?*

Scenario 3

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



Time for some great debates! In this exercise, students will learn the importance of being able to take a stance on an issue and defending that stance with logic, reasoning, knowledge, and common sense.

Below is a list of scenarios to present for students to discuss and debate. They are based primarily on ethics and morality. They will encourage students to take a stand and defend their viewpoint. These can be done in pairs, but are much more compelling in larger class debates where views are divided. They can also be used as individual worksheets—students can circle an answer and then explain their choice in writing.

1. Richard finds an expensive looking ring in the school hallway one day. It has no name on it, and it's not near anyone's locker.
Should he: **A)** Give it to lost and found **B)** Ask if it belongs to anyone there **C)** Keep it and not say anything
2. Judy's friend is stressed about an upcoming test. Judy already took the test and got 100%, so she knows all the answers already.
Should she: **A)** Just give the answers to her friend **B)** Use her knowledge to coach her friend **C)** Not get involved at all
3. Coach Nelson has caught two of his star basketball players vandalizing school property. The rule is that they must be suspended. If that happens their team loses the upcoming semi-finals. If the coach keeps quiet they'll surely win, but he could lose his job.
Should the coach: **A)** Suspend the two players and obey the rules **B)** Pretend he never saw them
4. Nick overhears two students bragging about having posted some inappropriate images of a female student online for a joke.
Should he: **A)** Mind his own business **B)** Report the incident to the school principal **C)** Confront the boys and defend the student
5. You witness a bank robbery, and follow the perpetrator down an alleyway. He stops at an orphanage and gives them all the money.
Would you: **A)** Report the man to police since he committed a crime **B)** Leave him alone because you saw him do a good deed
6. A friend tells you that he/she has been receiving anonymous bullying messages online. You suspect that certain people are guilty.
Would you: **A)** Tell your friend just to ignore them **B)** Encourage them to report the abuse **C)** Risk confronting the ones you suspect

SILENT SHARING

Here is an exercise for visualization and non-verbal communication. It involves conversing with writing and drawing to develop reflection and deliberate thinking.

Break into groups of 2 or 3. Each person gets their own sheet (or create one big one for the team). The teacher will provide an essential driving question to ponder. Write it at the top of the sheet. Next, reflect on the question and then begin “talking” about it using only writing and sketching in your space.

The Essential Question: _____

This is an exercise used in business to help you think fast and get your point across. It's all about choosing and using words carefully and persuasively to achieve your goals in any conversation.

You must convincingly “pitch” an idea, concept, product/service or proposal in the time it takes to ride an elevator (about 30 to 60 seconds) so this is a *timed exercise*. Make some notes about what you want to say; some topic ideas and note space are provided below. Enjoy the ride!

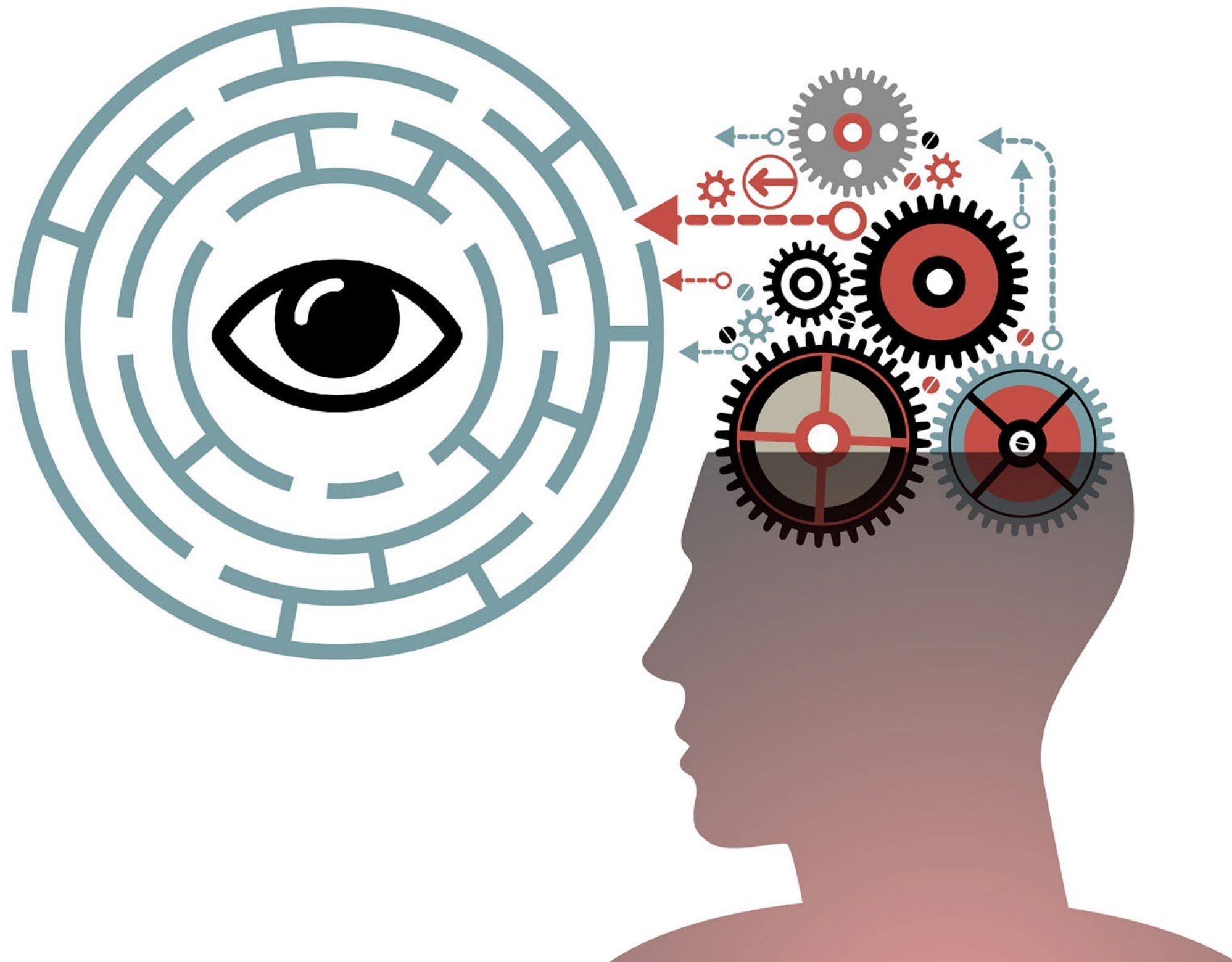
Ideas for EP Topics

- A product or service you are offering
- An idea for a website/social network
- A special project you need to fund
- A favour you need from someone
- An organization or business plan
- An invention you want to get patented
- A party plan for a birthday/wedding
- A campaign for a political position
- An advertisement for a local event
- An idea for a blog or a book
- A unique interior design for a space

My Topic: _____

Activities for

THINKING VISUALLY



REBUS ROUNDUP

Rebus puzzles use visuals that put a different spin on words or parts of words that are well known. Figure out the word or phrase for each of these rebus puzzles and write it underneath.

DECI SION

1 _____

AGE AGE AGE

2 _____

ANOTHER
↓
ONE

3 _____

CHIEDITOREF

4 _____

T 2222

5 _____

and better
and better

6 _____

10 AC

7 _____

MORAL
III

8 _____

GET IT
GET IT
GET IT
GET IT

9 _____

talk

10 _____

B
R
E
E
D
E
D

11 _____

ED

12 _____

PHROMATE

13 _____

SHOW

14 _____

TRAVEL
CCCCCC

15 _____

→ SECRET
SECRET
SECRET

16 _____

O_ER_T_O_

17 _____

↑ GET GO

18 _____

C YOURSELF
YOURSELF
YOURSELF
YOURSELF

19 _____

JACK

20 _____

TOTAL RECALL

Look at the objects and words on the page for 1 minute. Next, try to write down everything you remember seeing and reading on the page. If you're doing this one as a colour print-off, try recalling the specific colour of each word and shape too, if you can.



LUNCH



EAST



SUMMER



RIGHT



VACATION



RAINBOW



WEST



WINTER

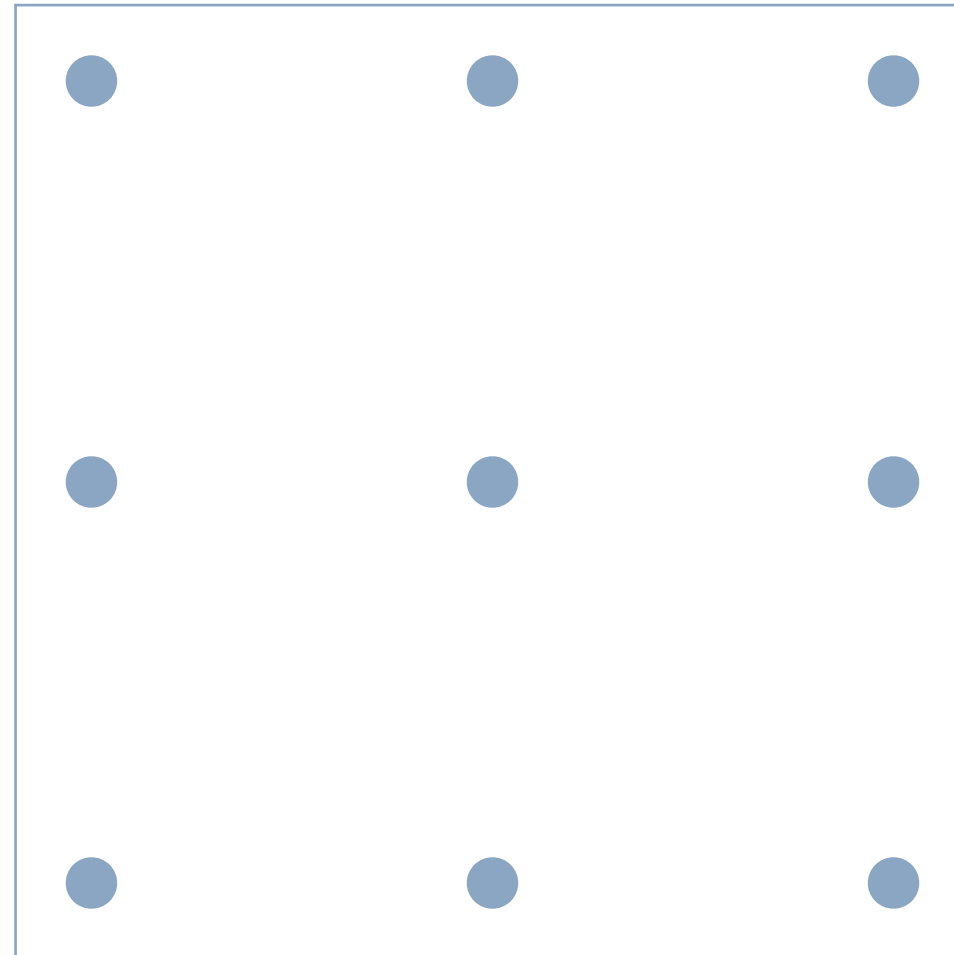


SUNGLASSES



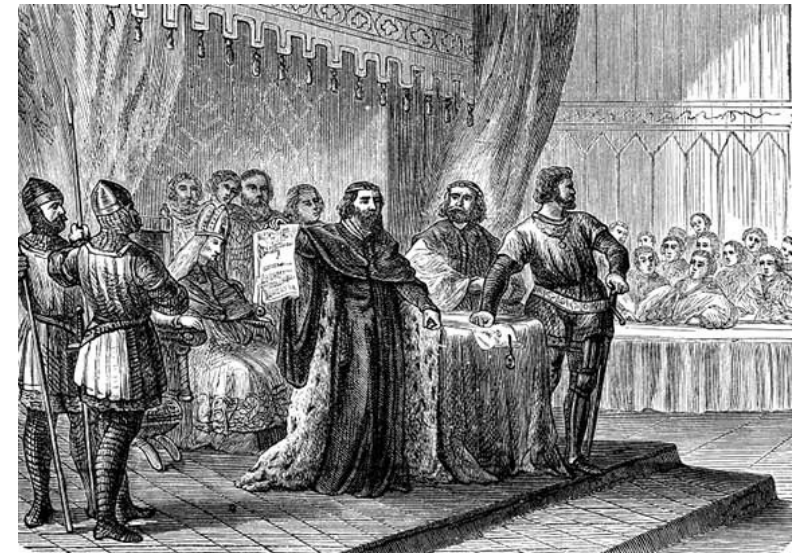
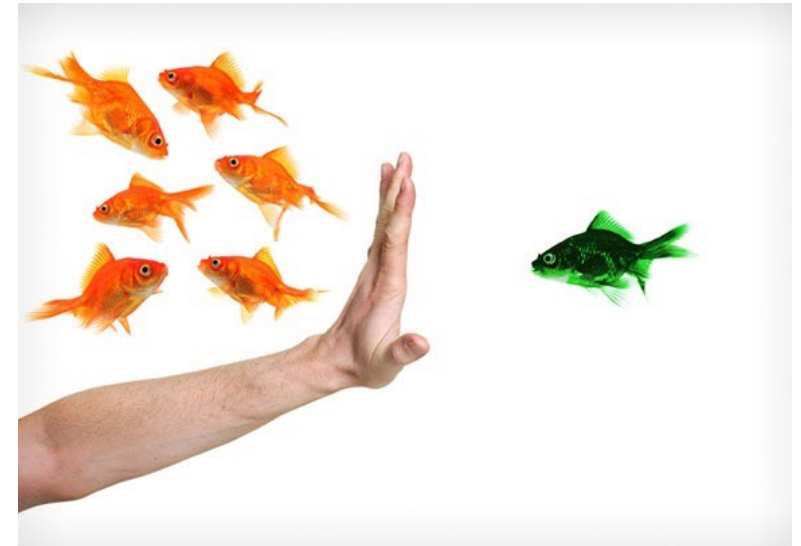
4/9 CONNECT

Connect these 9 dots using *only four lines*, and *without lifting your pencil from the paper*.
(**Hint:** Think beyond real and imaginary boundaries with this puzzle.)



CRAZY CAPTIONS

Put in your own creative wording for each of these images. You can write some dialog between the characters, write a single-line caption, or turn the image into a clever meme. Keep it short and witty!

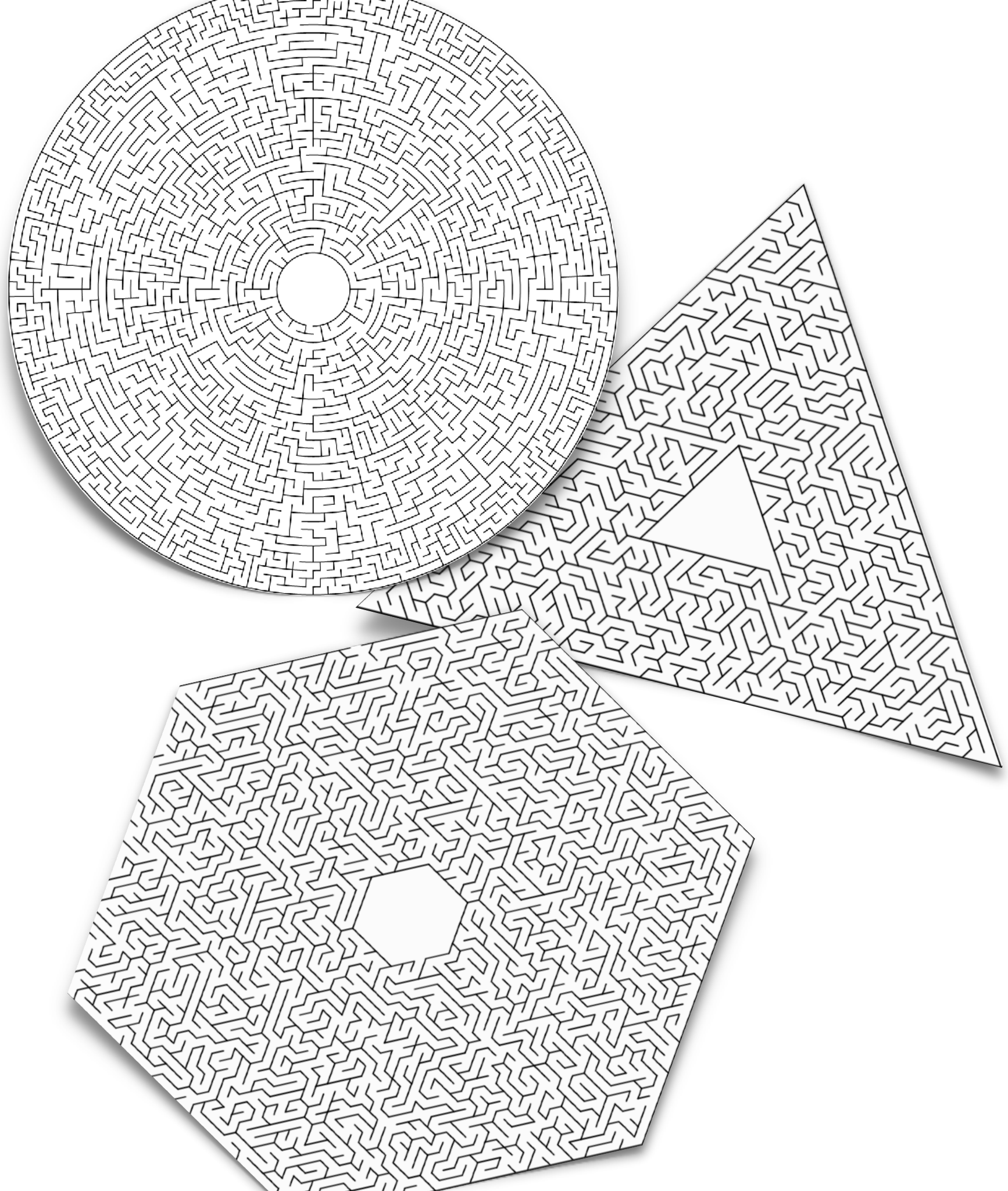


AMAZING MAZES

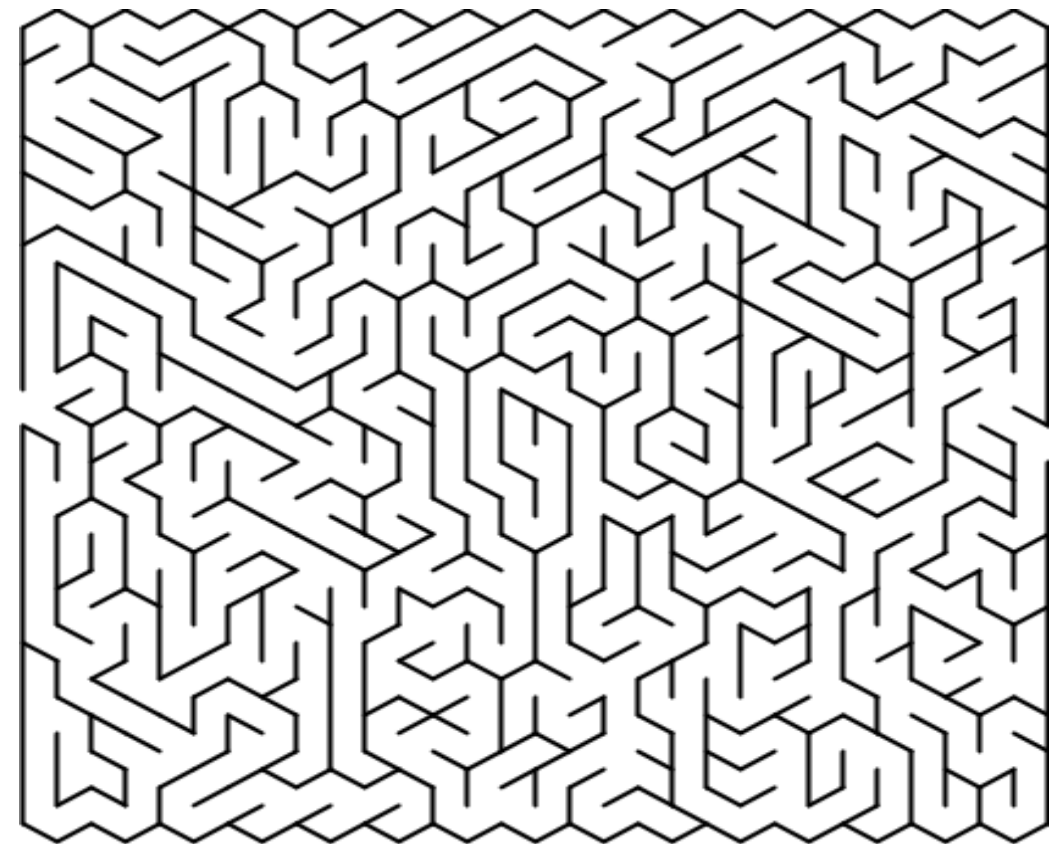
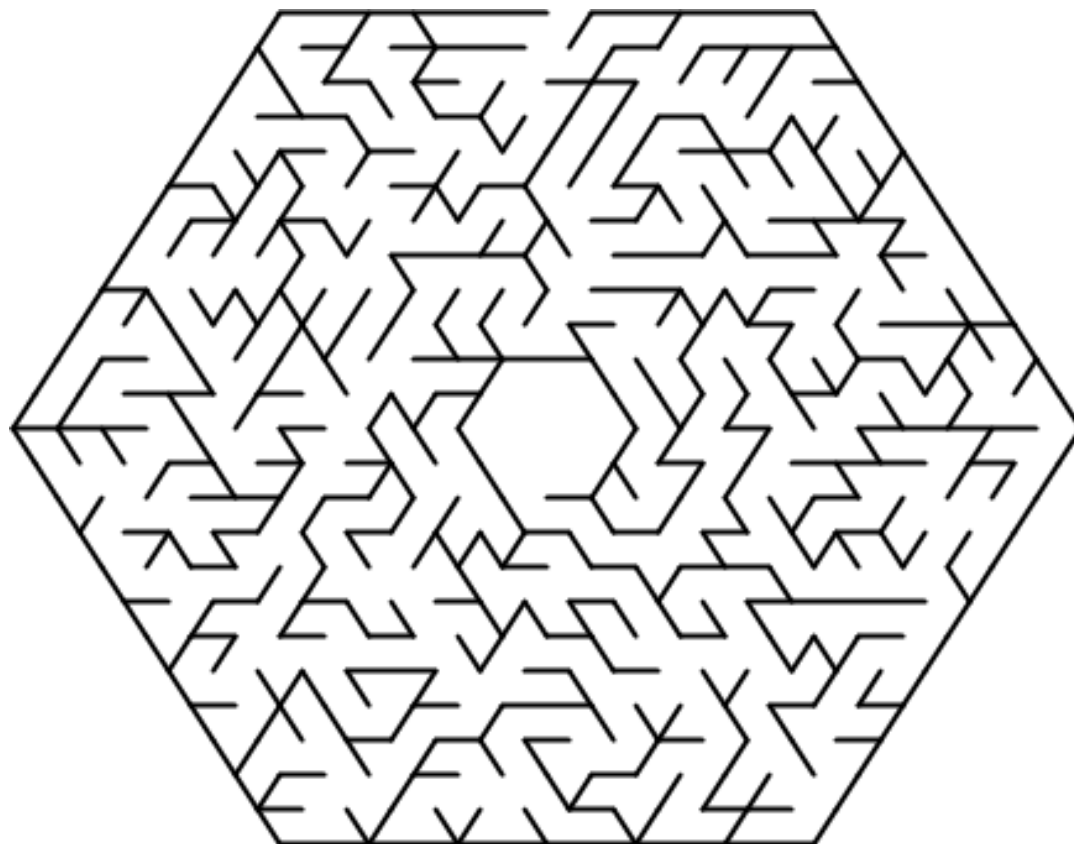
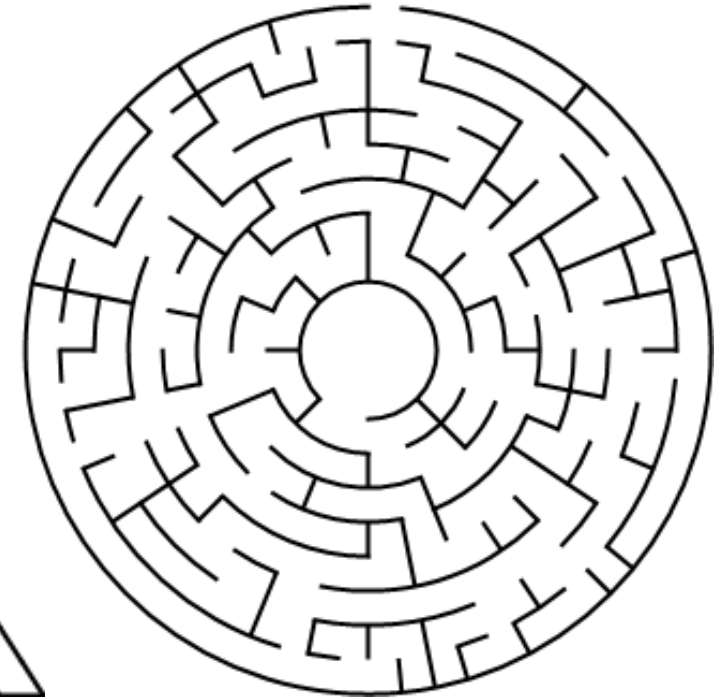
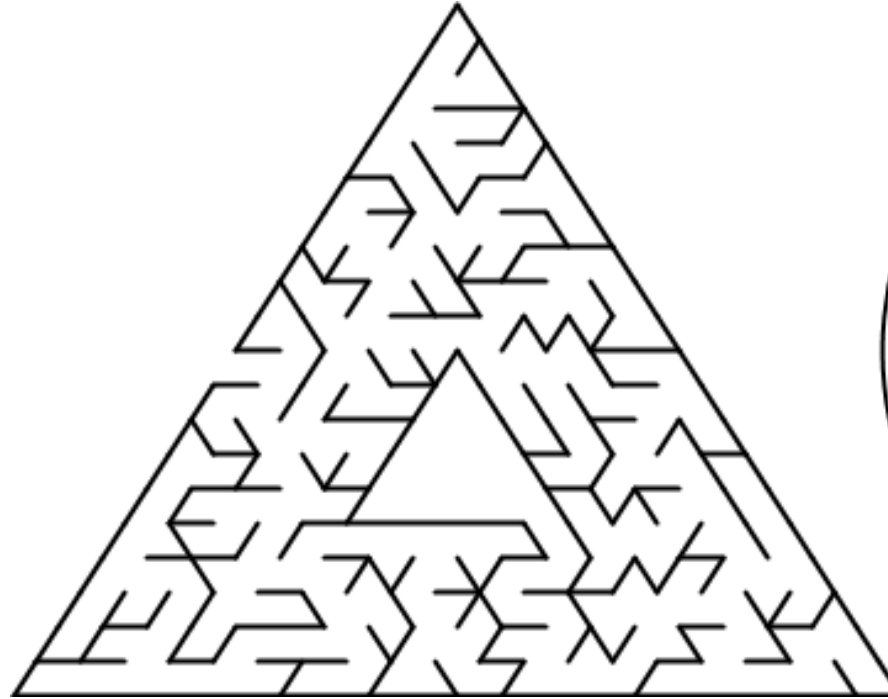
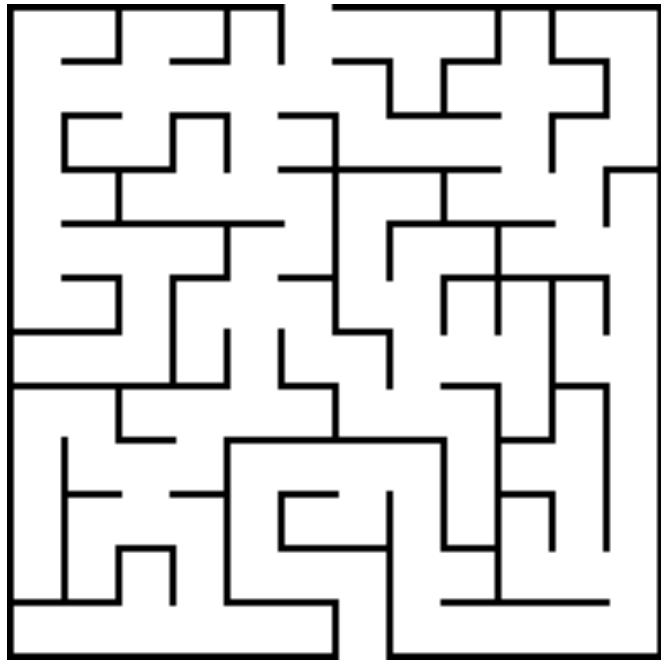
Mazes go back a long way in our world history, the first one on record being the famous Egyptian Labyrinth. We have been using mazes as critical thinking tools ever since, and a variety of them exist all over the world.

These intricate puzzles are brain boosters for things like fine motor skills, our spatial awareness, problem solving, concentration, and focus. When it comes to enjoying brain-healthy puzzles, mazes are still a world favourite.

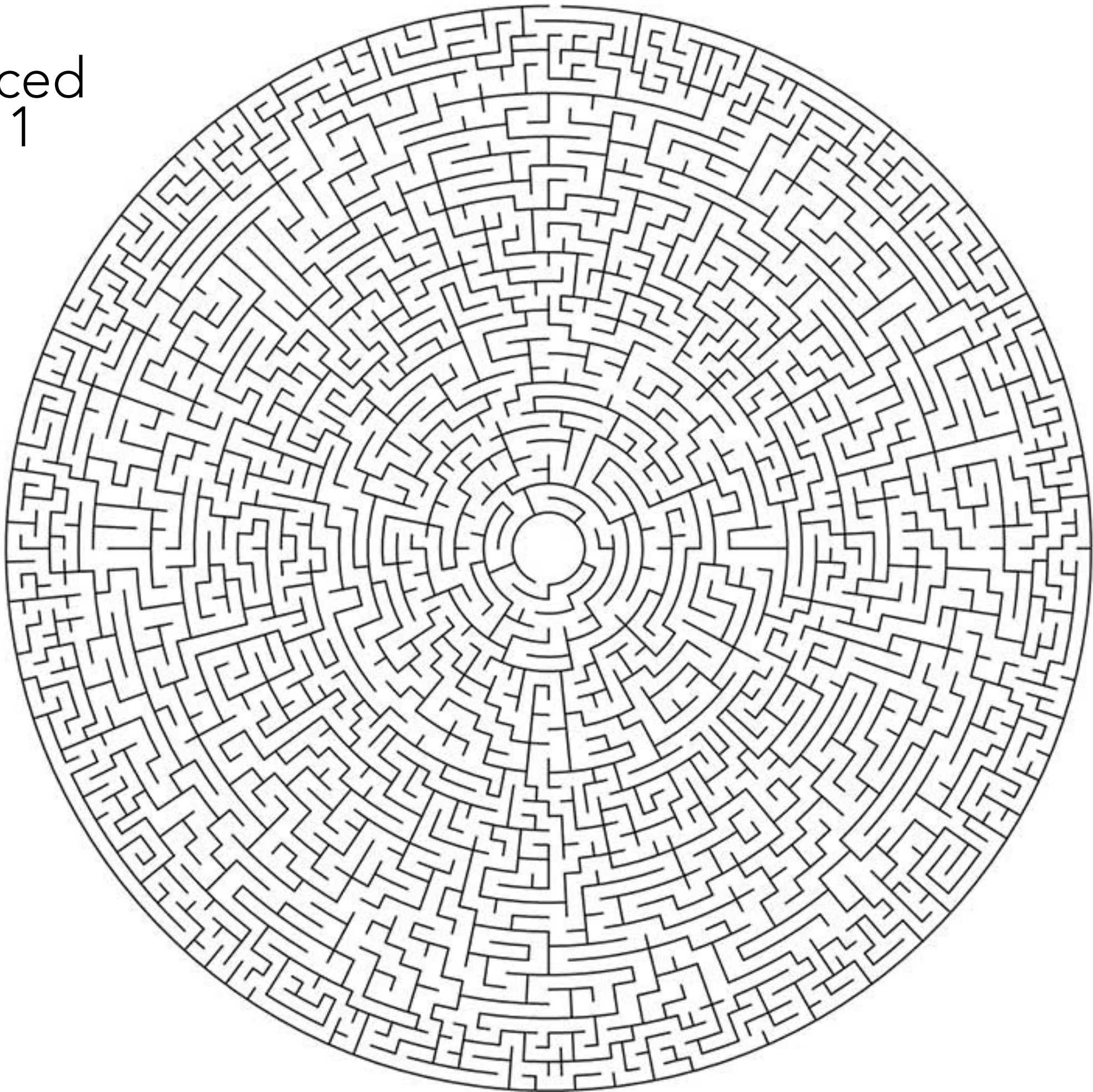
We have some challenging mazes for you here which were created right on the website [Maze Generator](#). They can be printed off as separate worksheets for students to work on.



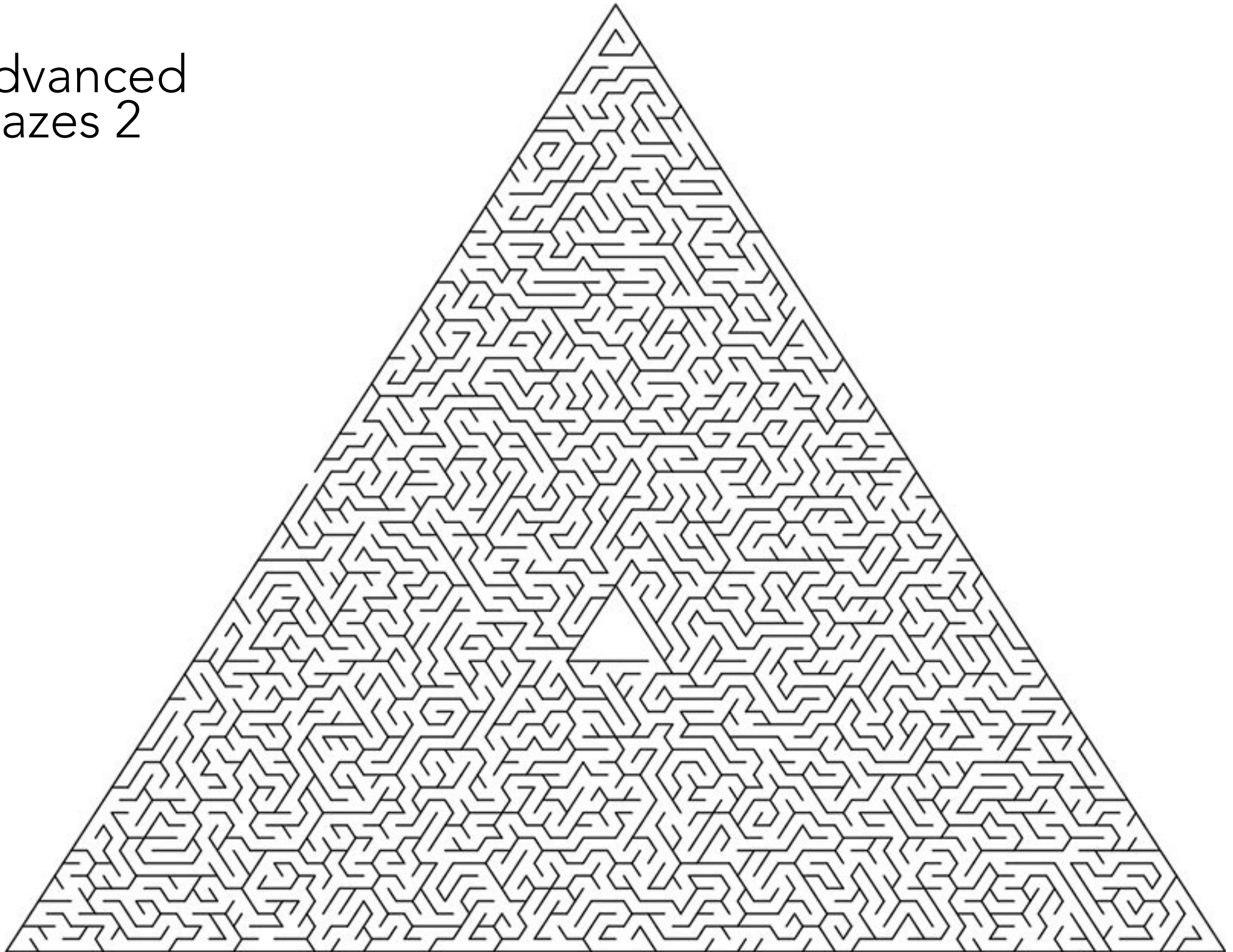
Basic/Intermediate Mazes



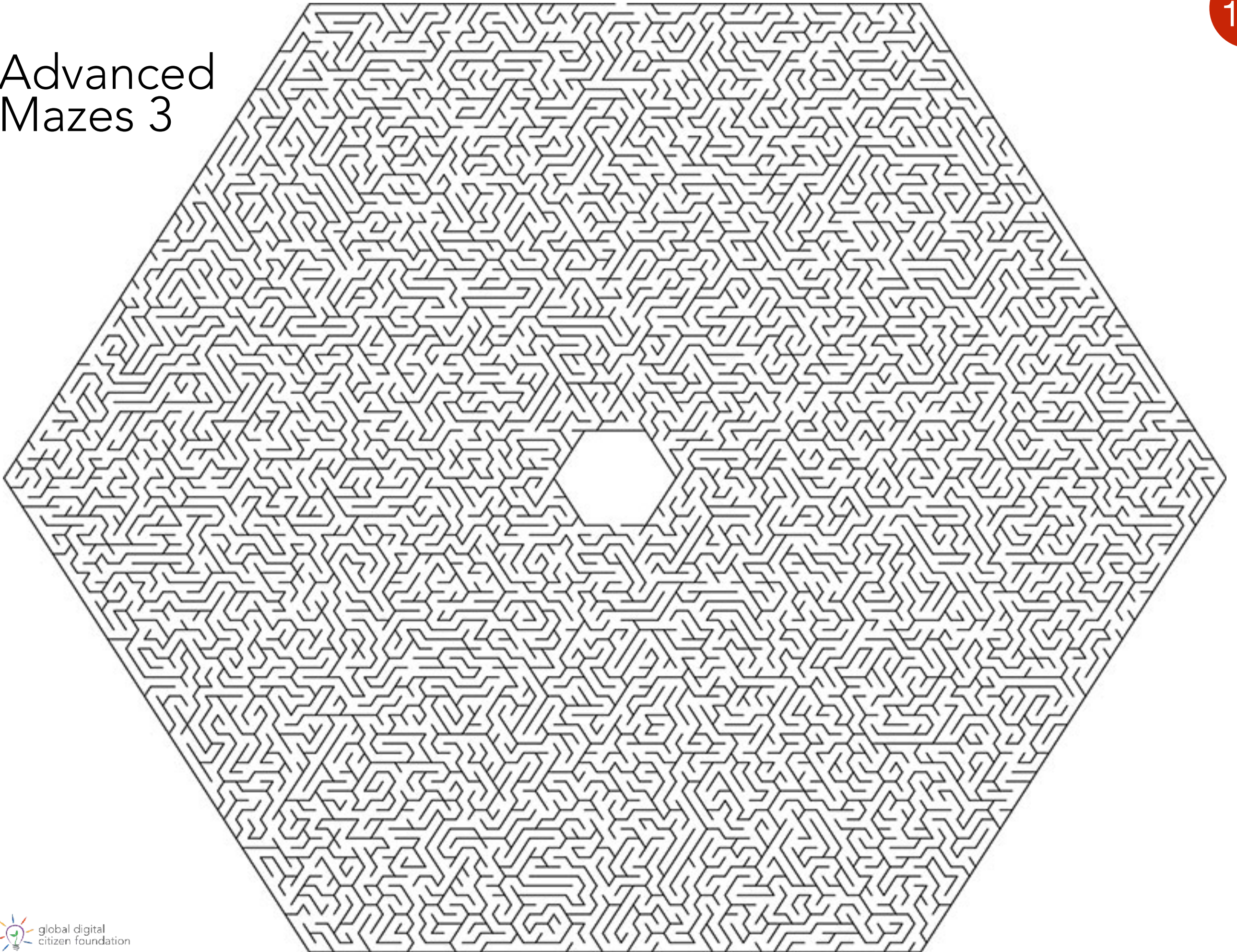
Advanced Mazes 1



Advanced Mazes 2



Advanced Mazes 3



MEANINGS IN MIND

Write *one sentence* to explain what each common image or symbol means to you. The idea here is to move away from conventional meanings and relate to the images personally.















AWESOME ANAGRAMS

Anagrams are words and sentences that can be written different ways to obtain more words or groups of words. Create new words by rearranging the letters in the ones below—some can be tricky!

SPEAR

REWARD

LEAST

REINS

PASTE

MISTER

TRACES

PLATES

SPREAD

POST

PLAYER

NAME

SKATE

SNAP

LEAP

PARTIES

RATES

RESTRAIN

PASS

TEAM

EAST

Activities for

INDIVIDUAL SKILLS



YOU NAME IT

Answer each question for each list below. To make it more challenging, try answering as quickly as you can against another person.

Name 3 people that:

1. Talk more than you

2. Talk less than you

3. Work hard

4. You think are smart

5. Wear costumes

6. Are teachers

7. Travel a lot

8. Are always nice to you

9. Have a job you'd love to do

10. Are very creative

Name 3 places that:

1. Have good food

2. You would like to visit

3. Have lots of mountains

4. Are always warm

5. You don't want to visit ever

6. Are not on Earth

7. Have a lot of technology

8. People haven't fought in wars

9. Have a lot of pollution

10. Are famous all over the world

Name 3 things that:

1. Are square

2. Are orange

3. Smell good

4. Live in the water

5. Taste terrible

6. You enjoy doing

7. You don't enjoy doing

8. People read

9. You see at school every day

10. Scare you

1001 WAYS

This is a brainstorming exercise. The class writes everyday objects on slips of paper and places all the slips in a box. You each draw a slip from the box, and the activity begins on a 15 min. timer. You must now come up with as many *new uses for your object as you can*. Write them down or sketch them out in the box—be as creative as you can! (You can also do this exercise in pairs or groups)

My Object: _____

WHAT WOULD HAPPEN?

This exercise is designed to help you think laterally and discover new ways of looking at the world. Answer these questions using creative and constructive thinking. You can use as much detail as you like. For fun, try to think of your own “What Would Happen?” questions!

What would happen if ...

... there were suddenly no computers, tablets, or phones of any kind anywhere on Earth?

... we had to live in a world without electricity?

... you woke up one morning to discover you had changed into a cartoon character?

... all the animals in the world could suddenly communicate with us in our own language?

... you discovered your best friend was a superhero?

EXPLAIN YOURSELF

How would you describe the following things and their sensations to someone who had never seen or experienced them before? Use all your senses in your descriptions!

A bunch of flowers

An automobile

A rainstorm

A laptop computer

A piece of chocolate

A rock concert

A hug from someone

A favourite place of yours

YOU KNOW THE RULES

The rules and laws we have in life are meant to guide us and protect us, and to keep order in our society. Imagine that you get to make 3 rules that *everyone in the world must follow*. What rules would you make and why?

Rule No. 1 _____

I chose this rule because:

Rule No. 2 _____

I chose this rule because:

Rule No. 3 _____

I chose this rule because:

Part of life is being able to strike a healthy balance between our needs and our wants. It's also about focusing on what we consider to be truly important. Imagine you can have *any 3 things that you want*. In return you must *give away three things that you already have*. What do you want and what will you give away, and why?

1. _____
2. _____
3. _____

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

1. _____
2. _____
3. _____

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

SKETCH THEM OUT

Everything around you—cars, buildings, even our personal electronic devices—all started with an idea. This is an exercise in *creative visualization*. In the space below, sketch out an idea for an invention or a concept you think would be cool. Some ideas are provided, but feel free to come up with your own.

Suggestions

- A portable source for charging a smartphone
- A traffic system that doesn't rely on colours
- A machine that turns trash into energy
- A "green" vehicle
- An all-new method of personal transportation
- A new immersive gaming system
- An idea for a tablet or smartphone app
- A challenging and fun new idea for a sport
- A clever design for an interior space
- An idea for a social networking domain

My Inventive Idea: _____

ADDITIONAL ACTIVITIES





Pair up with a partner and test each other with these fun and challenging “job interview” questions. This one is all about lateral thinking and common-sense viewpoints. It’s also about active listening!

1. A man buys a new car and goes home to tell his wife. He goes the wrong way up a one-way street, nearly runs into 7 people, goes onto the sidewalk, and takes a shortcut through a park. A policeman sees all this and still doesn’t arrest him. Why not?
2. If you had a machine that could generate one million dollars a day, what would you be willing to pay for it?
3. Why is it against the law for a person living in New York to be buried in California?
4. One house is made of red bricks, one of blue bricks, one of yellow bricks, and one of purple bricks. What is the green house made of?
5. A little girl kicks a soccer ball. It goes 10 feet and comes back to her. How is this possible?
6. In South Africa you can’t take a picture of a man with a wooden leg. Why not?
7. You drive past a bus stop and see 3 people waiting for the bus: an old lady who is about to die, an old friend who saved your life, and your perfect partner. Knowing you can only have one passenger in your car, what would you do?
8. How much dirt is there in a hole 3 feet deep, 6 feet long, and 4 feet wide?
9. If it took 8 men 10 hours to build a wall, how long would it take 4 men to build the same wall?
10. How far can you walk into the woods?
11. How many books can you put in an empty backpack?
12. Your friend says he can predict the exact score of every football game before it begins. He's right every time. How is that possible?



WORST CASE SCENARIO

In a crisis situation, teamwork is crucial to handling challenges effectively. Fabricate a scenario in which students need to work together and solve problems to succeed (ex: stranded on a deserted island, being lost at sea, etc.). The rule is that every team member must contribute an idea for a possible solution.

For example, they may want to come up with a list of 10 must-have items that would help them most, or find a passage to safety. Arrange for them to vote so that everyone agrees to the final solution.



TRAIN of TALL TALES

Form into a circle and give everyone a unique picture of a person, place, object, or animal. Pick one person to begin a story that incorporates whatever happens to be on their photo. The next person continues the story adding something related to their photo, and so on.



PAPER TOWER

This fun collaborative team-building exercise develops aspects of Solution, Creativity, and Collaboration Fluency. Each group constructs a free-standing tower out of newspaper and tape. There isn't a time limit for this exercise, unless you want to establish one.

It encourages critical thinking and problem-solving. Which team can build the tallest, structurally sound free-standing tower? Throughout the process, students will start to realize there are questions they have that they didn't ask. This is a perfect time to get them to explore how to answer these questions for themselves.



CLASS MINEFIELD

This is an exercise based on building communication and trust between people. Arrange some sort of obstacle course and divide students into teams. Students take turns navigating the "minefield" while blindfolded, with only their teammates to guide them. You can also require students to only use certain words or clues to make it challenging or content-specific.

TEACHING RESOURCES



Critical Thinking SKILLS RUBRICS

We can assess critical thinking by breaking it down into its different components, and then determining criteria you can use with students. The following rubrics cover the most crucial aspects of critical thinking.

The rubrics are based on the stages of Bloom's Taxonomy. They can be used for teacher or peer assessment.

QUESTIONING ABILITIES

This is all about the student's ability to formulate questions and frame relevant inquiries around a specific problem or challenge. It also refers to the ability to state the questions clearly and concisely so as to be easily understood by anyone else.

USE OF INFORMATION

Information is everywhere today and the amount we have available is growing exponentially. Part of the critical thinking abilities students need involve finding information that is useful and relevant to their needs in school and in life.

KEEPING AN OPEN MIND

It takes many cultures, beliefs, and stories to make a world. There are also many possible answers to the questions we face every day in life. Critical thinkers remain open at all times to the multiple possibilities within their environments.

DRAWING CONCLUSIONS

When we draw conclusions, we see the true purpose of an information quest come to its fruition. It gives us an opportunity to clarify whether or not our question was answered or our challenge was met. It is also the recognition of new learning.

COMMUNICATION & COLLABORATION

The classrooms and workforces of today and tomorrow are places of teamwork and trust. Learning how to build connections and manage a role in a collaborative group is an essential modern learner skill. Such skills are life skills.

SELF-AWARENESS

By far, one of the most important aspects of our being able to think critically is based in self-awareness. It's knowing potential without any expectation, limits without judging, and ability without arrogance. It is mastery of the self.

QUESTIONING ABILITIES

1

awareness
connection
remembering

2

understanding
applying

3

analyzing
evaluating

4

evaluating
creating

34

Defining the Problem	Develops a basic definition of the problem that would enable a solution.	Develops a definition that would enable a successful solution. The definition sets some of the success criteria.	Breaks definition down into components. Elements are given a logical sequence and extraneous information is removed.	Definition shows critical reflection. Breaks definition down into components. Elements are given a logical sequence. Evaluates the definition for completeness.
Using Keywords	Identifies some keywords. Some keywords are redundant or irrelevant.	Identifies a suitable range of relevant keywords. Uses specific keywords and concepts to receive clarification.	Breaks the problem down into its component parts and identifies a suitable range of relevant keywords.	Identifies a suitable range of relevant keywords and uses these to form relevant and exploratory questions.
Citing Information Sources	Recalls a simple list of the resources used with little or no citations provided.	Applies suitable citation techniques to develop an appropriate record of sources.	Provides a detailed and structured record of information sources. Sources are properly organized, presented, and acknowledged.	N/A
Forming Exploratory Questions	States basic questions to collect some information. Some questions are redundant or irrelevant. Many questions are closed.	Develops some probing questions that are focused and will yield useful information. There are few closed questions.	Develops a range of inquiry questions that are focused on the problem. The questions enable effective and efficient access to information.	Develops inquiry questions focused on the definition that enable access to a broad range of information sources. Reflects on and refines the questions as required.
Articulation in Framing Questions	Frames basic questions that require simple or often only single-word responses.	Frames questions clearly. Questions require some consideration.	Is able to determine the primary information needs for framing the questions. Can reframe and restate the questions to require thoughtful answers.	Can determine primary information needs and state or restate question creatively to receive thoughtful answers. Is able to develop new questions spontaneously.

USE OF INFORMATION

1 awareness
connection
remembering

2 understanding
applying

3 analyzing
evaluating

4 evaluating
creating

Use of Resources	Accesses the provided resources.	Accesses a range of resources including and beyond provided options. Most sources are suitable and/or authoritative.	Accesses a range of select and authoritative resources, which could include appropriate primary sources.	Creatively accesses a broad range of suitable and imaginative resources, which could include primary sources.
Organization & Analysis of Collected Data	Information is recorded but lacks structure or organization.	Information is organized to allow access and recall. Suitable tags, keywords and descriptions are often included.	Information is organized/structured for easy access, recall and modification of search/research parameters. Suitable tags, keywords, and descriptions are included.	N/A
Performing Checks on Source Backgrounds	Does not validate information for accuracy or factual basis.	Performs basic validating of sources. Will sometimes include multiple related sources but does not judge them critically.	Critically evaluates each information source. Provides multiple sources. Can recognize bias and opinion.	Can break down and evaluate information into component parts. Can justify the process and validity of information. Recognizes bias and opinion.
Processing Data Into Information	Data is often presented in a basic unprocessed format or with minimal processing.	Processes the data collected into suitable forms. Has accuracy in processing and some errors. Will sometimes undertake error checking.	Will often undertake error checking. Often reviews information to validate its accuracy. Is able to analyze some of the limitations of the processed data.	Creatively processes the data collected into easily accessible forms. Critically reviews information for accuracy, and can identify complex patterns.
Application of Information to Original Problem	Makes some use of the collected information. Information remains in its original form with little refinement.	Applies the information to develop an understanding of the task, background, etc. Sometimes recognizes areas of limited validity.	Reviews information, makes judgements on the depth of knowledge required for the task. Recognizes areas of limited validity, and refines or undertakes new searches.	Uses processed information to structure the task. Applies information from multiple sources and mediums imaginatively. Validates the accuracy of all information.

KEEPING AN OPEN MIND

1 awareness
connection
remembering

2 understanding
applying

3 analyzing
evaluating

4 evaluating
creating

Seeing Possibilities	Takes a single view of the components of a problem or challenge, and sees a single solution.	Offers a limited number of solutions that would address the majority of the components of the problem or challenge.	A range of solutions that will solve the problem is proposed. The different components of the problem are identified for each solution.	A range of creative and imaginative solutions which will solve the problem are proposed. Critically reflects on the positives and negatives of each solution.
Cultural Awareness	Struggles to be culturally aware and supportive of others' differences.	Shows an awareness of cultural differences, sometimes applying general guidelines when interacting with their peers.	Shows an awareness of cultural differences and will frequently use these as guidelines for their interactions.	Demonstrates awareness of cultural differences and always uses these as guidelines for their interactions.
Resilience	Struggles to accept criticism. Will sometimes avoid challenges rather than persisting.	Will often accept criticism and apply suitable actions resulting from this. Sometimes is persistent, occasionally overcoming adversity and intolerance.	Shows ability to reflect on criticism, often taking onboard the relevant elements. Will frequently persist to overcome adversity and intolerance.	Shows ability to reflect on criticism, evaluating its worth and taking onboard the relevant elements. Will persist to overcome adversity and intolerance.
Constructive Communication	Sometimes shows awareness of and consideration to others. Will sometimes express gratitude or appreciation.	Shows consideration to others. Sometimes is supportive and will generally offer suitable feedback. Shows gratitude and appreciation.	Generally is supportive and proactive and will offer feedback that is suitable and task-appropriate. Shows support, gratitude and appreciation.	Caring and empathetic to people. Offers task-appropriate feedback and works with others to help them improve. Is always supportive, considerate, proactive, and appreciative.
Curiosity	Will sometimes demonstrate curiosity. Shows little enthusiasm for discovery.	Often curious and will sometimes show a love of learning and discovery. Sometimes asks questions to facilitate this.	Frequently is curious and inquiring. Often shows a love of learning and discovery, and will ask questions to acquire and evaluate new knowledge.	Actively and constantly curious and inquiring, showing a love of learning and discovery. Asks creative questions to acquire, evaluate and expand on new knowledge.

DRAWING CONCLUSIONS

1 awareness
connection
remembering

2 understanding
applying

3 analyzing
evaluating

4 evaluating
creating

Making Summaries	The summary is often superficial and incomplete. Some next steps may be offered but are not linked to original task.	Summarizes the different stages of the process undertaken. Reflection is generally appropriate and fair. Some areas for further research are identified.	Provides a suitable summary and evaluation of the process undertaken. Reflection is considered and appropriate, and clear next steps are provided.	Offers a clear and concise summary/evaluation of the process. Reflection is considered, deliberate, and appropriate, and clear next steps are provided.
Connecting Results	Produces results which may or may not be suitable to the original purpose.	Produces results with consideration of their suitability to the original purpose.	Produces results considering suitability to, and feasibility for, the original purpose. Checks the solution against the success criteria before accepting or rejecting it.	Critically checks the solution against the success criteria for suitability/feasibility. Modifies the solution or selects a new solution if it is not feasible. Considers time, cost, etc.
Useful Failure	Is aware of mistakes and knows that improvement is needed. Needs guidance for next steps. Struggles to accept feedback.	Is aware of mistakes and can determine areas for improvement. Is willing to take steps to improve. Will usually accept and consider feedback.	Shows awareness of mistakes and where to improve and what is needed to progress. Evaluates feedback to determine next steps.	Shows awareness of mistakes and areas for growth and improvement. Critically evaluates all feedback and creates and executes next steps to improve and progress.
Reflecting on the Process	Recalls the steps taken to achieve their results. Offers little reflection or suggestions.	Reflects on their process and progress against the overall objectives. Will sometimes offer useful reflections or suggestions.	Reflects on the process, analyzing their contribution and that of their peers against the overall objectives. Offers task-focused reflections and suggestions.	Offers critical reflections that are task-focused and which enable development of themselves or their peers, or refinement of processes and structures.
Knowledge Expansion	Suggests few ideas for expanding knowledge.	Suggests some appropriate ideas for expanding and applying knowledge.	Suggests some ideas for expanding and applying knowledge, evaluating each for feasibility. Identifies areas of further research.	Provides creative ideas for expanding and applying knowledge, evaluating each for feasibility. Identifies areas of further research and suggests next steps.

COMMUNICATION/ COLLABORATION

1

awareness
connection
remembering

2

understanding
applying

3

analyzing
evaluating

4

evaluating
creating

Establishing a Group Contract	A basic goal-focused contract is developed.	A goal-focused contract is developed establishing the expected behaviours for the group.	A goal-focused contract is developed establishing the expected behaviours for the group, and guidelines for conflict resolution. Appropriate roles are considered/suggested.	A goal-focused contract is developed establishing the expected behaviours for the group, and guidelines for conflict resolution. Contract supports individuality, and designates appropriate roles.
Interpersonal Skills	Listens to others' input and occasionally combines their own to produce an understanding of the task.	Frequently listens to others' input and combines their own to produce an understanding of the task. Sometimes encourages team members to contribute.	Listens to others' input and combines their own to produce an understanding of the task. Frequently encourages team members to contribute based on their personal strengths.	Listens to others' input and combines their own to produce an all-inclusive understanding. Ensures all team members contribute and feel valued according to their personal strengths.
Sharing Responsibility	Has a marked preference for their role in the team, and will not willingly change from this. Rarely makes contributions.	Shows an interest in different roles in the team, but has a preference for one role. Will sometimes make contributions.	Shows ability to act in the different roles in the team, and will help in other roles when needed. Regularly makes effective contributions.	Can act efficiently in multiple team roles, and consistently makes effective contributions. Is always supportive and encouraging.
Conflict Management	Seldom manages conflict. Will seldom act to deal with inappropriate behaviour.	Sometimes manages conflict in a mature and non-judgemental manner. Sometimes will act to deal with inappropriate behaviour.	Often manages conflict in a mature non-judgemental manner. Often will act to deal with inappropriate behaviour constructively as possible.	Manages conflict in a mature non-judgemental manner. Will consistently deal with inappropriate behaviour constructively and ethically.
Recognition of Team Efforts and Service	Is aware of the group's and their own individual progress. Seldom compares results against team milestones.	Acknowledges the group's and their own individual progress, and measures it against the team milestones.	Analyzes the group's and their own individual progress against the milestones, and recognizes individual strengths of team members.	Analyzes the group's and their own individual progress against the milestones, suggesting areas for improvement. Celebrates individual/team strengths and contributions.

SELF-AWARENESS

1 awareness
connection
remembering

2 understanding
applying

3 analyzing
evaluating

4 evaluating
creating

Knowing Personal Abilities	Shows little awareness of their own abilities.	Demonstrates awareness with some understanding of their own abilities. Shows ability to act in different roles.	Demonstrates awareness of the spectrum of their own abilities. Shows ability to analyze various roles and to act in different roles.	Demonstrates awareness of the spectrum of their own abilities, how those abilities align with various roles, and in which role they are best suited to be successful.
Awareness of Limitations	Shows little awareness of their own limitations.	Shows some awareness of their own limitations. Shows willingness to improve, but needs guidance and encouragement.	Knows own limitations and shows willingness to improve in weak areas. Shows desire to act independently to achieve this. Has a desire to learn.	Is fully aware of personal limitations. Shows proactive action in independently improving in weak areas. Takes active steps toward learning and progressing.
Lifelong Learning Capacity	Occasionally shows enthusiasm for learning and discovery.	Sometimes shows a love of learning and discovery, and has potential to be a life-long learner.	Frequently is curious and inquiring. Shows a love of learning and discovery, seeing opportunities to develop an understanding of their world.	Curious and inquiring with a love of learning and discovery. Actively enjoys opportunities to develop a richer understanding of their world.
Managing Personal Emotions	Has difficulty managing emotions. Has little ability or awareness of how behaviour affects others.	Manages personal emotions with difficulty. Is aware of how their behaviour affects others.	Can sufficiently manage personal emotions. Is aware of how emotions affect focus and concentration. Is mindful of how their behaviour affects others.	Effectively manages their personal emotions. Is always focused and balanced. Is mindful of how behaviour affects others. Can pinpoint emotional triggers to manage them effectively.
Accountability	Is aware their actions effect others. Occasionally accepts responsibility for their actions.	Considers the impact of their behaviours/actions on others. Will sometimes take action to change behaviour.	Analyzes impact of their behaviours/actions on others. Takes responsibility to avoid, reduce, or minimize such impacts.	Evaluates impact of their behaviours/actions personally, locally, and globally. Takes responsibility and proactively avoids, reduces, or minimizes such impacts.



GHOST BUMPS

How can we use our knowledge of history to create a spooky story?

SUBJECTS

Language Arts, History

Scary stories are such an exciting form of reading and storytelling! There is nothing as exhilarating as a story with suspense, monsters, or shocking experiences within the storyline.

A first grade teacher needs help to demonstrate oral storytelling to her first graders. She wants the third graders to create an original spooky story to share orally with the first graders. Another requirement needed by the teacher for the spooky stories is it has to be based on a popular historical character or event.

This is a great way to celebrate an historical approach of oral storytelling and sharing important, factual information about important events and people. Many of these historical stories possess some form of warning or moral to teach others to avoid bad decisions, action or choices made by characters in the stories.

- **DEFINE:** Students will create their own spooky story based on a historical character or event to share at a special spooky camping event in their classroom.
- **DISCOVER:** Brainstorm spooky stories they might know and compile a class list of spooky stories. Have students form groups and search for age-appropriate spooky stories.
- **DREAM:** Students must uncover the components and delivery of the story to the audience. How can students incorporate factual content from history into a fictitious story?
- **DESIGN:** Students create outlines for their stories. Their outlines should contain all of the appropriate story elements, components and historical connection.
- **DELIVER:** Time to get spooky! Kids can now recite their stories and answer follow-up questions from their young campfire audience. For fun, make it an outdoor event if possible.
- **DEBRIEF:** Why are spooky stories so important? Does writing and sharing spooky stories such as these remind you of any other experiences in school or in your community?



TOUR GUIDES

How can you use mapping technologies to attract tourists to a region?

SUBJECTS

Geography, Mathematics, Language Arts

Your local chamber of commerce is trying to boost the economy by attracting more tourists to your area. They are asking local residents to record virtual tours on Google Earth that can be posted to the town website.

Each tour must be composed of three to five "stops," include at least two local geographic landmarks (mountains, rivers, etc) and one historical point of interest. The tours are also required to make use of the voice-over narrative function on Google Earth, to guide the viewers through each point of interest.

You will need to find out about the stops you include in your tour and write out a script for the narrative before recording it. Where would you take people to give them a stellar visit?

- **DEFINE:** In this unit, students work in pairs to create virtual tours of their local areas. They map out 3-5 stop tours and write voice-over tour narratives.
- **DISCOVER:** The students begin to brainstorm stops for their tours. What would they like to include and what could make their tour original and alluring?
- **DREAM:** The purpose of the tour is to draw tourists into the region. How will they make their tours beautiful, informative, and entertaining for visitors?
- **DESIGN:** Students will need to outline their voice-over narratives, and set aside time for writing the full descriptions of each tour stop along with the longitude and latitude.
- **DELIVER:** Each student pair has created a 3-5 stop virtual tour of their area. They now present their tours before the class. Classmates are encouraged to ask questions after viewing.
- **DEBRIEF:** Let students share thoughts on the tours. Which ones were the most informative and the most fun? Which do they think would be best for boosting the local economy, and why?

DESIGN STARDOM

If you were an interior designer, how would you use math to bring your visions to life?

SUBJECTS

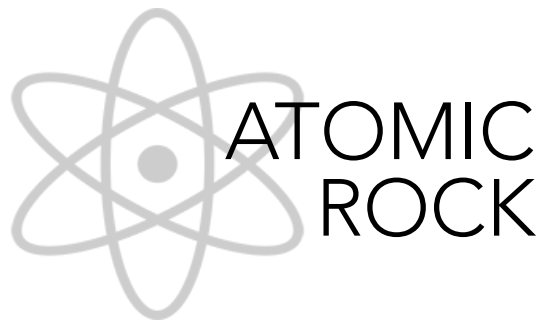
Math, Language Arts, Design, Art, Technology, Digital Media

A successful designer is one who has an innate sense of style and a solid mathematical foundation. Could you succeed in the design industry? This is a great way to find out.

Select a messy or uninspiring space to redesign, and build a scale model to display your vision. Plan the new design and build a diorama that displays the major lengths, widths, and heights of the space to scale. Then put your design mojo to work. This will call upon all your creative and mathematical talents. Draw inspiration from your favourite designs. Chat with industry professionals and learn how they approach design challenges.

You can create a video or slideshow that captures the design process along with “before” shots of the chosen space and “after” shots of your scale model. Design your perfect space!

- **DEFINE:** Students will redesign spaces of their choosing. They'll calculate, measure, and write mathematical narratives, and create a video, slides, or before-and-after shots.
- **DISCOVER:** Let students consider what space they might like to redesign and how they'd like to change it. Encourage them to think about who will benefit from this remodelling.
- **DREAM:** Have them start writing down their ideas for a redesign. Also get them to think about the math and measuring that will be involved with each design element.
- **DESIGN:** The teams must now finalize their plans for the remodel and create a timeline with specific milestones, deadlines, and responsibilities.
- **DELIVER:** Have them complete their models and narratives, and use equations, ratios, and proportions to draw up a budget. They can then make their presentations.
- **DEBRIEF:** What did they learn about mathematics and interior design? Did the remodel require more or less math than they expected?



How can we use music & performing arts to teach the scientific properties of matter?

SUBJECTS

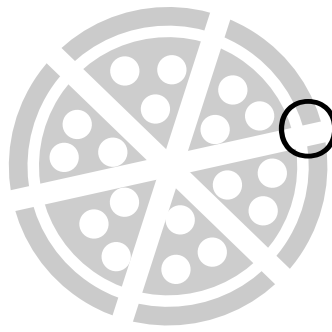
Science, Mathematics, Language Arts, Performing Arts, Music

A local TV network that hosts a popular children's show wants science classes in your grade to work together to create a musical segment for its show. The songs it is looking for must be entertaining, and provide an informative science lesson for children about the properties of matter.

How would your class use research and inquiry to teach a subject like this to children in a fun, musical way that makes the knowledge stick in their minds?

Each group's challenge is to teach the audience about atoms, molecules, elements, and compounds. Each group will do scientific research into the characteristics of its matter property and how it relates to the other three. Then, each musical group will write a song designed to teach children about its matter property on the new show that is being developed.

- **DEFINE:** Students are writing songs to teach children a science lesson about the properties of matter. These songs are part of a musical segment designed for a local children's TV show.
- **DISCOVER:** Each group will familiarize itself with the structural properties of matter, and are also learning about playing the roles of songwriters, researchers, and instructors.
- **DREAM:** What kind of song would catch the attention of young children and help them learn about the subject matter? What kind of performance will students create to teach with?
- **DESIGN:** What kind of a song do students want to write to engage kids in learning the scientific properties of matter? What kind of visuals and equipment do they want to use?
- **DELIVER:** The groups will now present the performances of their songs. Arrange for a larger audience than just the class if possible. Make it a concert!
- **DEBRIEF:** What have they discovered about creativity, and how is it vital to relevant learning? How much more memorable is the content when it is presented with artistic flair?



ORDER UP!

What are some of the factors you need to consider when designing a business?

SUBJECTS

Mathematics, Language Arts, Marketing, Advertising, Creative Planning, Design

Most of us have a favourite spot that we like to go to eat and drink. Something about the atmosphere, the ambience, and the vibe about the place just appeals to you. And of course, it helps to have great food!

Ask yourself, "If I were designing a restaurant, what would it look like? What kinds of food would I serve? Who will be my main clientele? What about signature dishes my establishment could one day become famous for? And once I've got it, how will I promote it?"

Well, it's time to find out. You and some friends are going to design your unique theme restaurant. Let your creative abilities soar as you think of your theme, plan what it will look like, and create delicious and appealing menu items.

- **DEFINE:** In this unit, students will design their unique theme restaurant, along with a unique name and logo for their business. They'll also create an exciting promotional spot for TV or radio.
- **DISCOVER:** Students should learn about small business ownership, including all legalities and responsibilities, graphic and logo design, advertising, and interior design principles.
- **DREAM:** Have them visualize their interiors, and the specialty menu items. What is the radio or TV promotion that will bring people to them, and keep them spreading the word?
- **DESIGN:** Students will now begin developing their ideas into concrete visions. Each group will use the talents of each member to share the tasks.
- **DELIVER:** The groups are now going to present their design ideas in their chosen format for the rest of the groups to assess. They can even cook their recipes for actual sampling.
- **DEBRIEF:** Encourage them to reflect and discuss what goes into making an establishment appealing and enjoyable enough to people to maintain an expanding business over time.



WHAT A RUSH *How can we determine the changes that occur in our bodies when moving at fast speeds?*

SUBJECTS

Science, Mathematics, Language Arts, Physics

Race car and motorcycle drivers control their vehicles at incredible speeds and need excellent physical conditioning, precision timing, and lightning-fast reflexes to stay competitive and safe.

Your team is putting together a presentation on the effects of speed on the human body for drivers who are new to the race circuit. These individuals want a clear understanding of the physical changes and sensations they will experience at the tremendous speeds they'll be reaching.

They also require help developing a training program to enhance their physical conditioning to be better prepared for the first race. Include diagrams, animations, and a prescribed training program for your clients that will build and maintain their conditioning gradually over time to prepare them for the track.

- **DEFINE:** Student groups will put together presentations on the effects of speed on the human body as part of a training package for professional drivers, and a three-month conditioning program.
- **DISCOVER:** Have them focus on sensations and symptoms felt by racers, and the optimum body mass, body fat percentages, heart rate, reflexes, and oxygen consumption rates they need.
- **DREAM:** How will students help their clients understand as what will happen to them physically when they are in the middle of a high-speed race, and how best to prepare for it?
- **DESIGN:** Student begin to research and experiment to obtain data, and develop their findings into concise representations. They'll use this information to design their training programs.
- **DELIVER:** Have them present their projects on the physiological effects of extreme speeds during racing, and present their training plan outlines.
- **DEBRIEF:** Students reflect on their research and the scientific investigations they used in this lesson. Also get them to reflect on how they illustrated these facts in their presentations.

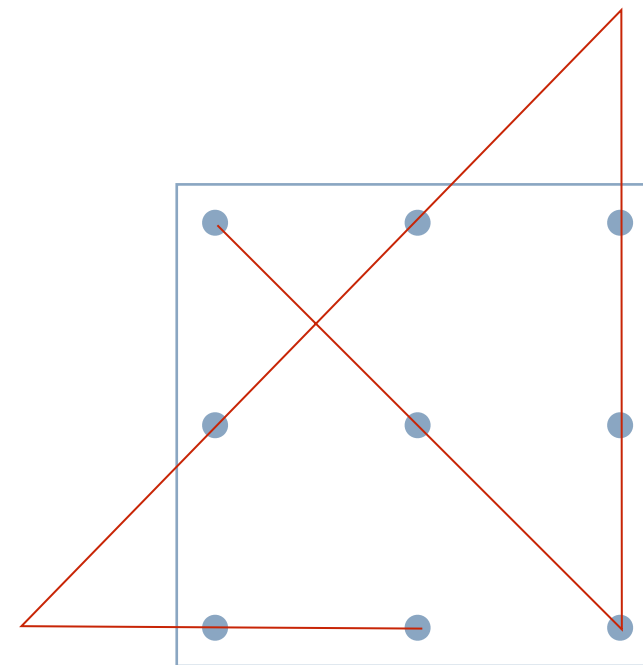
Answer Key

REBUS ROUNDUP

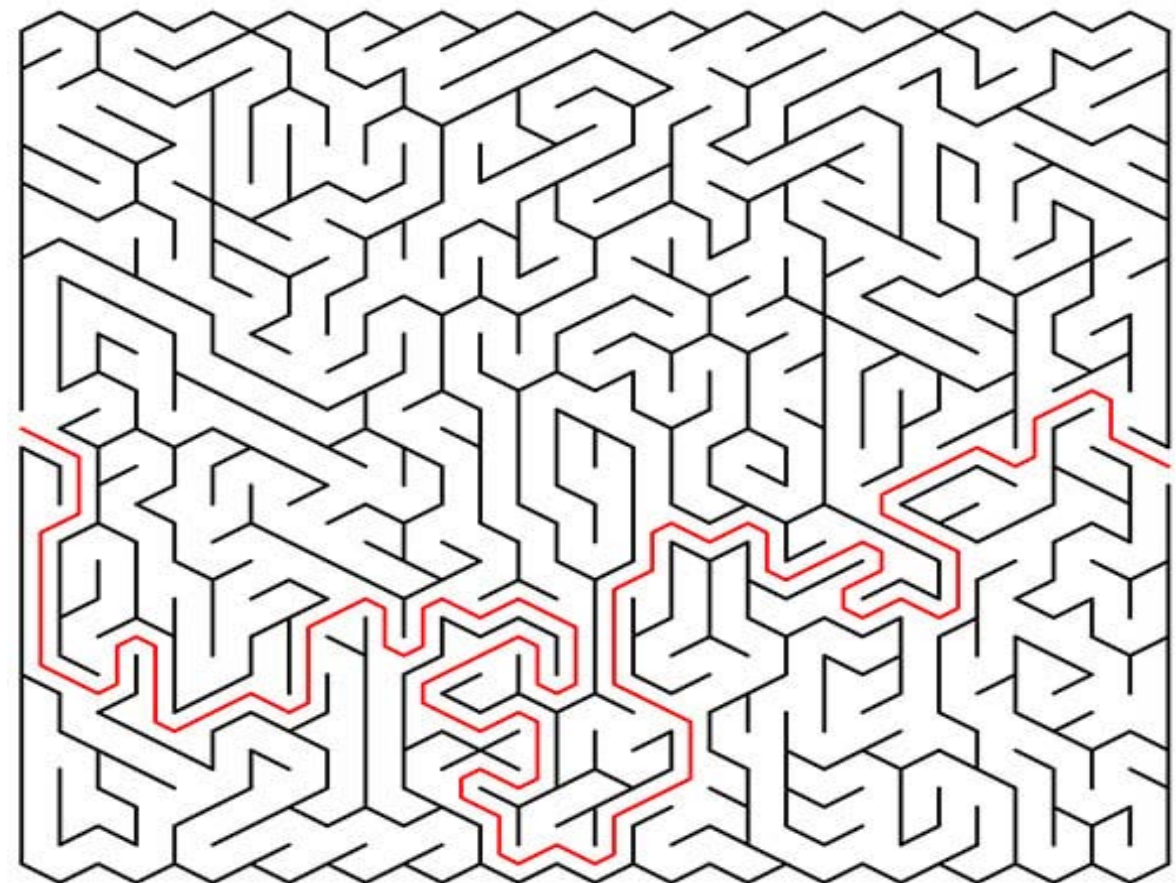
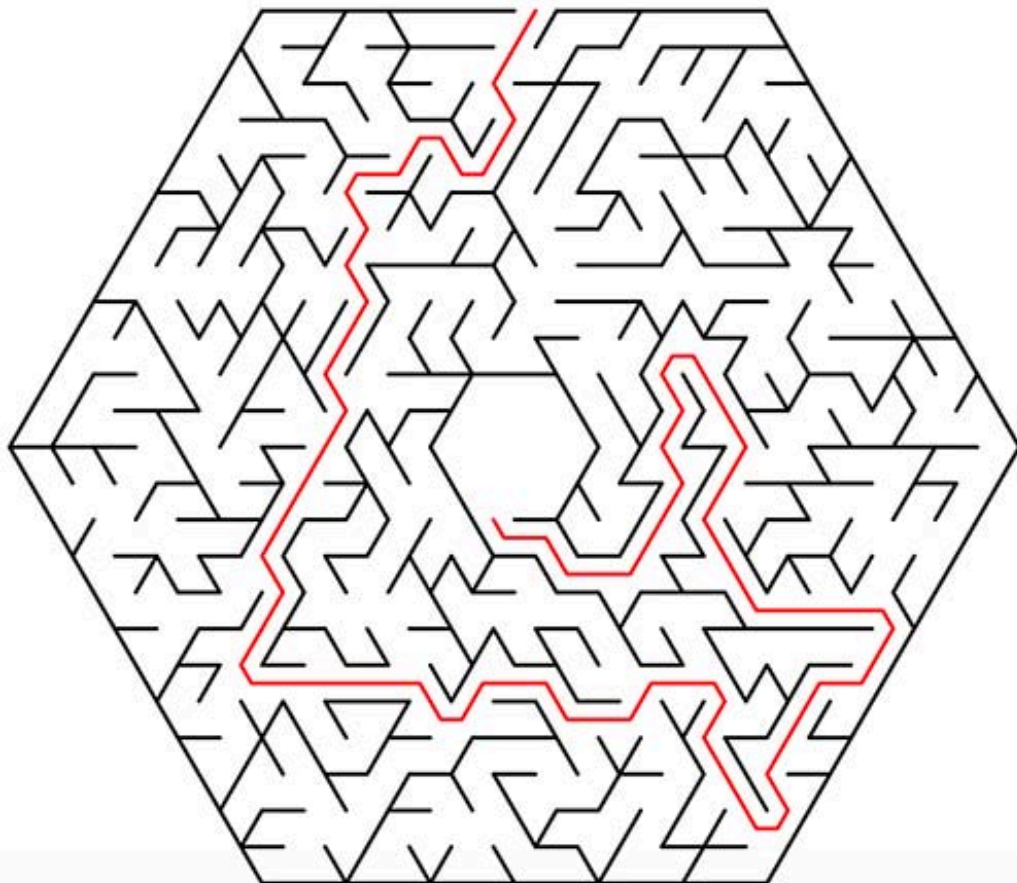
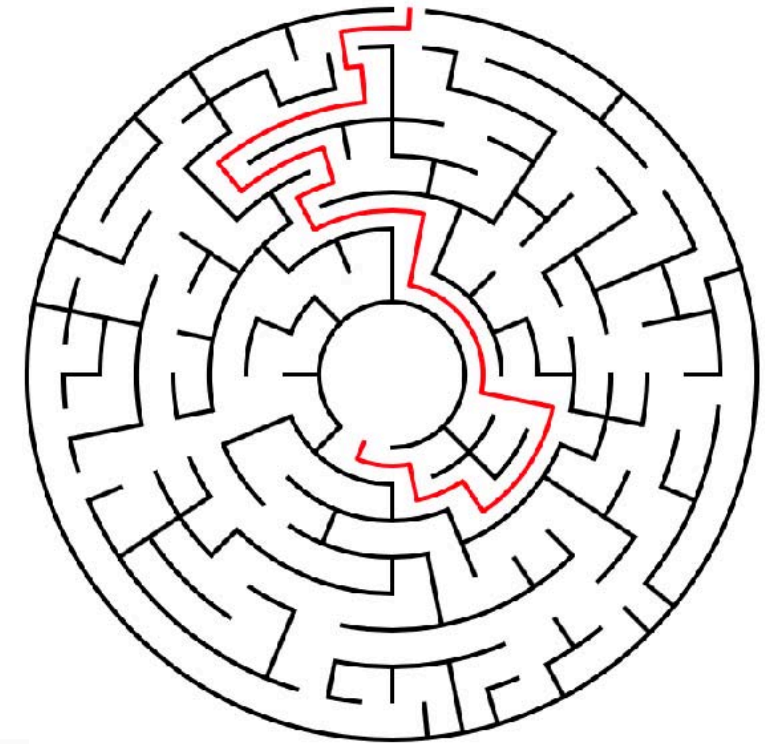
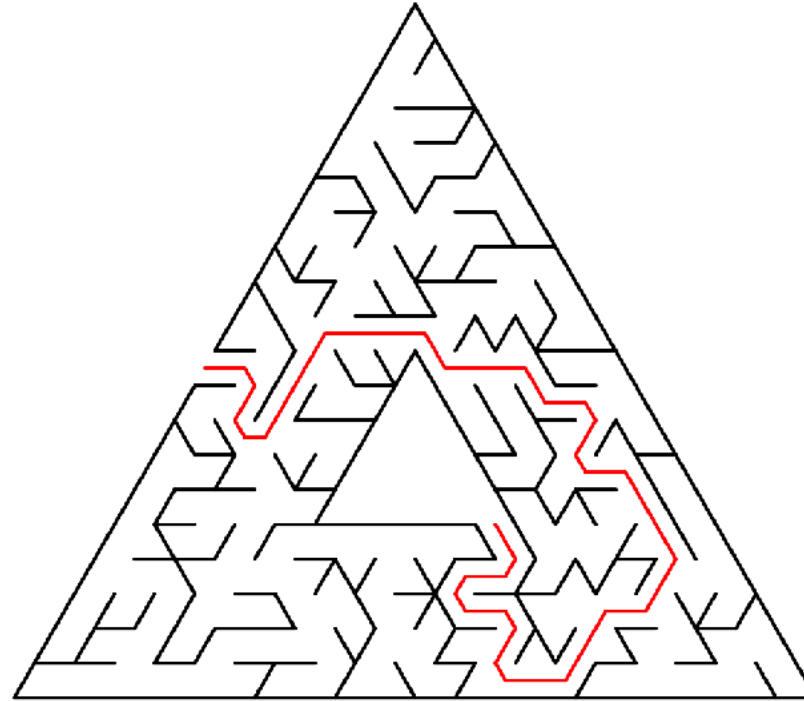
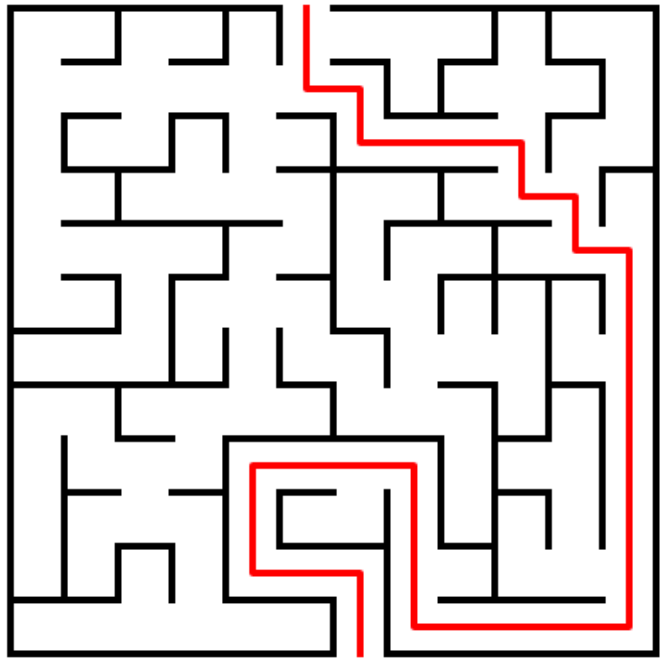
- | | |
|----------------------|------------------------|
| 1. Split decision | 11. Cross breed |
| 2. Middle age | 12. Half-hearted |
| 3. One after another | 13. Mixed metaphor |
| 4. Editor in chief | 14. Sideshow |
| 5. Tea for two | 15. Travel overseas |
| 6. Bigger and better | 16. Top secret |
| 7. Tennessee | 17. Painless operation |
| 8. Moral support | 18. Get up and go |
| 9. Forget it | 19. See for yourself |
| 10. Small talk | 20. Jack in the box |

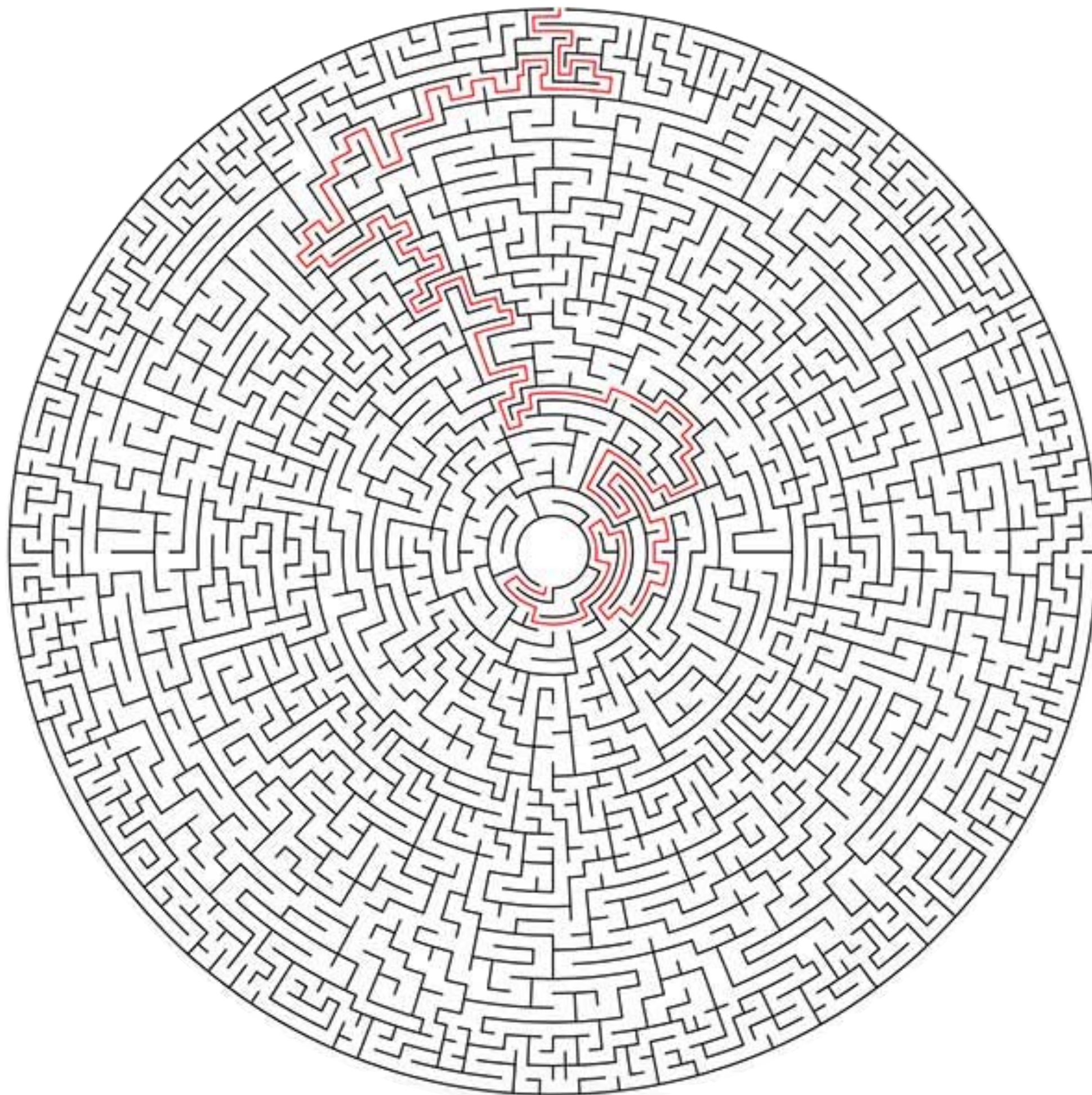
4/9 CONNECT

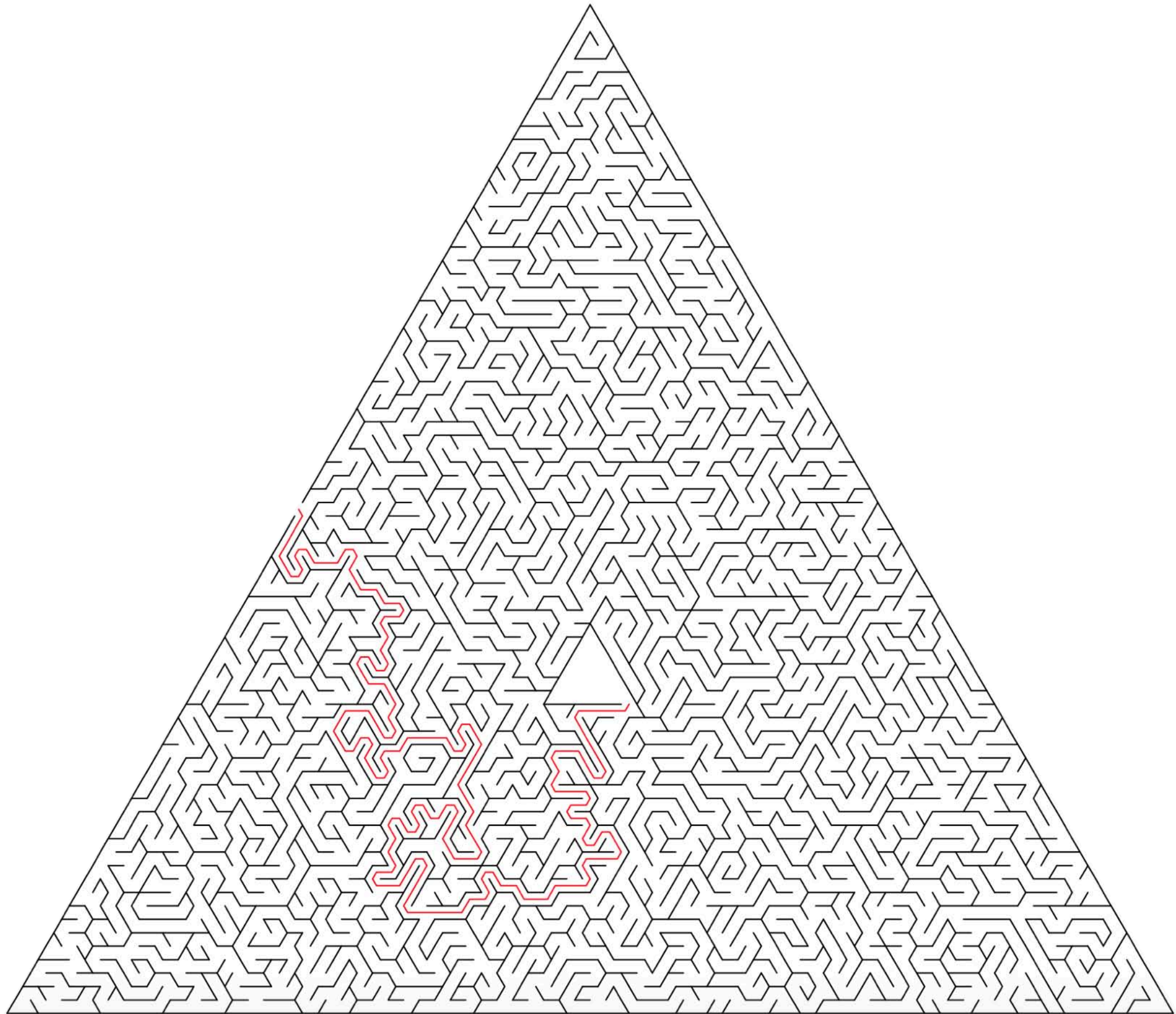
Start experimenting with lines that extend outside the square, and the answer comes quickly. Here is a solution: if the dots are numbered 1 through 9 from left to right, draw a line from dot 1 through 5 to 9, then up through 6 and 3 and outside of the box, then back down through 2 and 4, then right through 7 and 8. This will allow you to create other solutions based on these rules

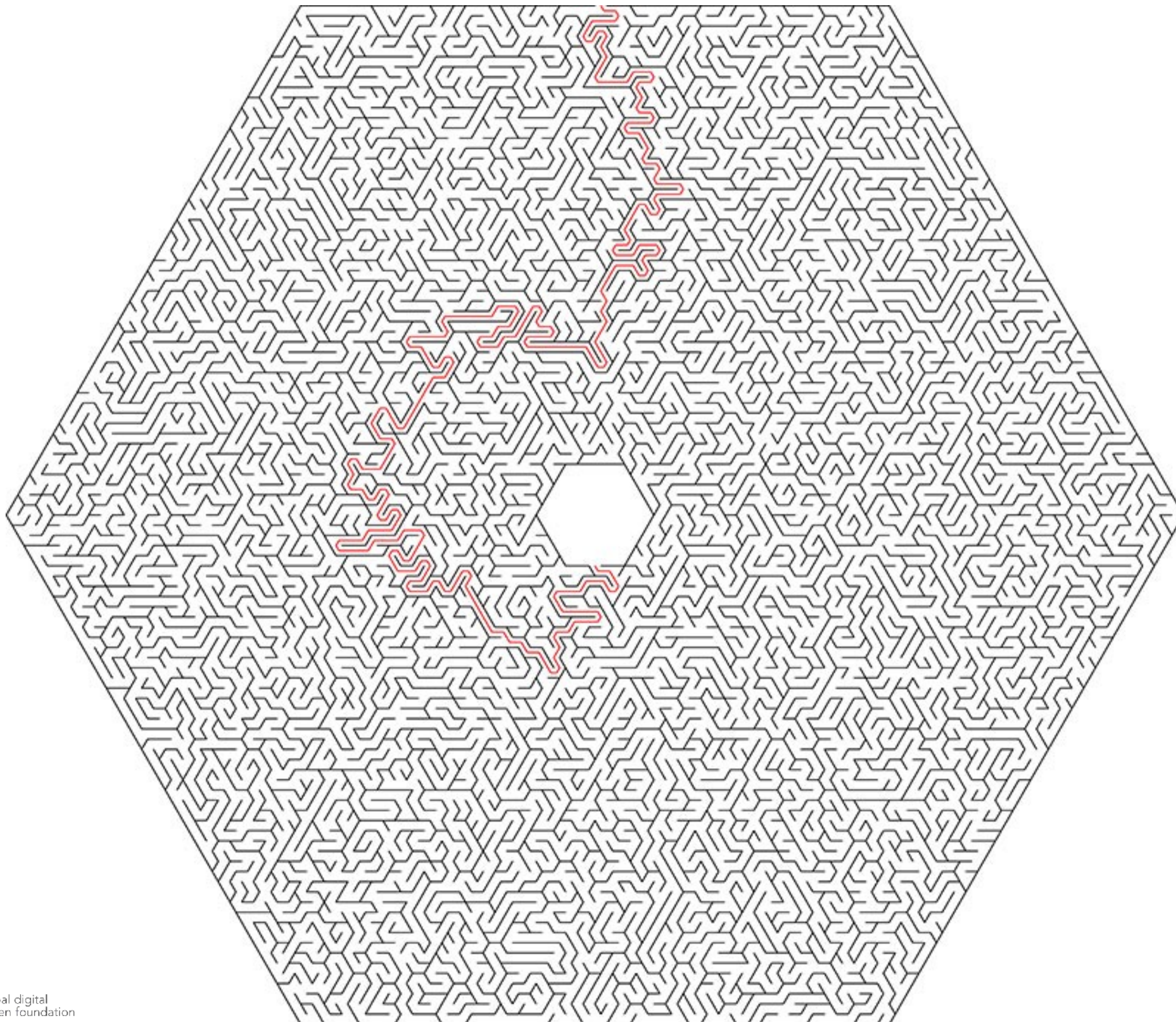


BASIC/INTERMEDIATE/ADVANCED MAZE SOLUTIONS









AWESOME ANAGRAMS

Spear

pare
parse
pears
reaps
spare

Reward

drawer
redraw
warder
warred

Least

slate
stale
steal
tales
teals

Reins

resin
rinse
risen
siren

Paste

tapes
peats
septa
spate

Mister

merits
miters
mitres
remit
timers

Traces

carets
caters
caster
crates
reacts
recast

Plates

pare
parse
pears
reaps
spare

Spread

drawer
redraw
warder
warred

Post

opts
pots
stop
tops

Player

parley
pearly
replay

Name

amen
mane
mean

Skate

stake
steak
takes
teaks

Snap

nap
pans
span

Leap

pale
peal
plea

Parties

pastier
pirates
traipse

Rates

aster
stare
taser
tears

Restrain

retrains
strainer
terrains
trainers

Pass

asps
saps
spas

Team

mate
meat
tame

East

eats
sate
seat
teas

STRANGE INTERVIEW

1. The man was walking.
2. Why pay for the machine if you already have it?
3. Burying people who are still alive is a crime.
4. Glass panels.
5. She kicked it straight up into the air.
6. You can't take a picture with a wooden leg; you have to use a camera.
7. Give the car keys to your friend, and let him take the old woman to the hospital. Then stay behind and wait for the bus with your perfect partner.
8. None—otherwise it wouldn't be a hole.
9. The wall is already built; no need for anyone to build it again.
10. Halfway—after that, you're walking out of the woods.
11. You only need one; then the backpack isn't empty.
12. The score before any football game begins is 0:0.



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