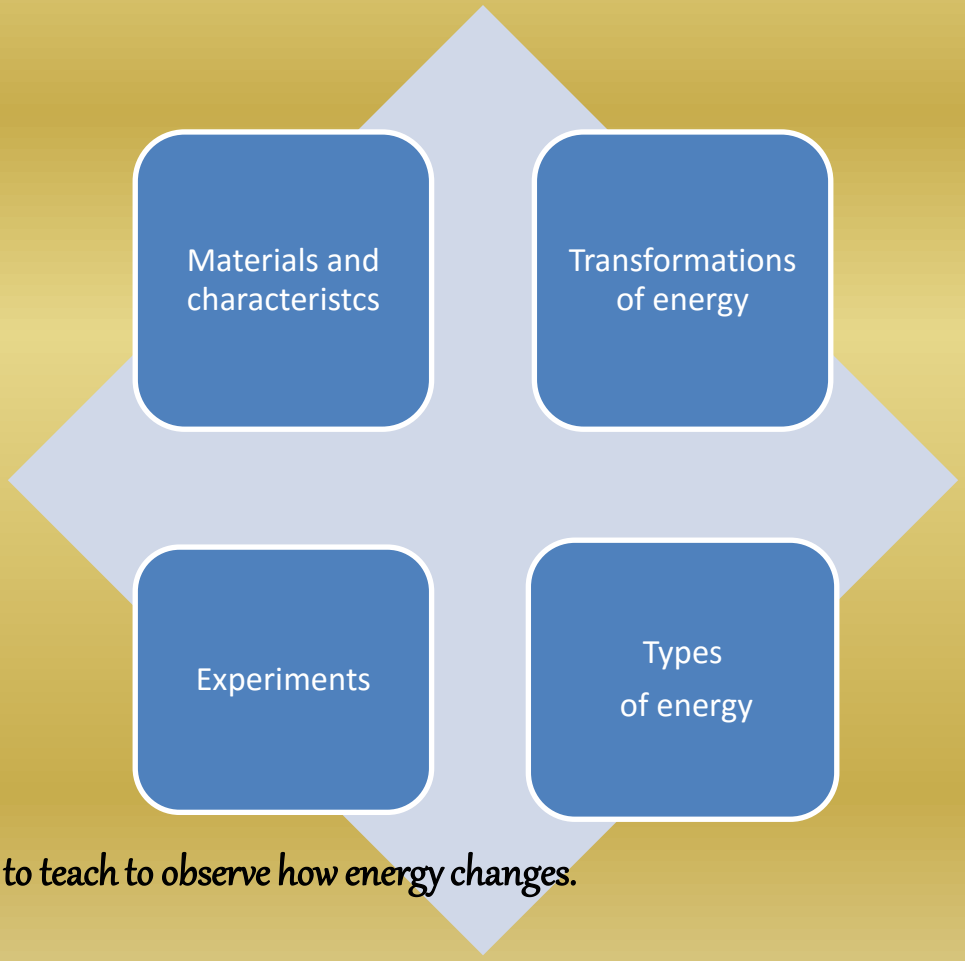
MATTER AND ENERGY

CP Vital Aza

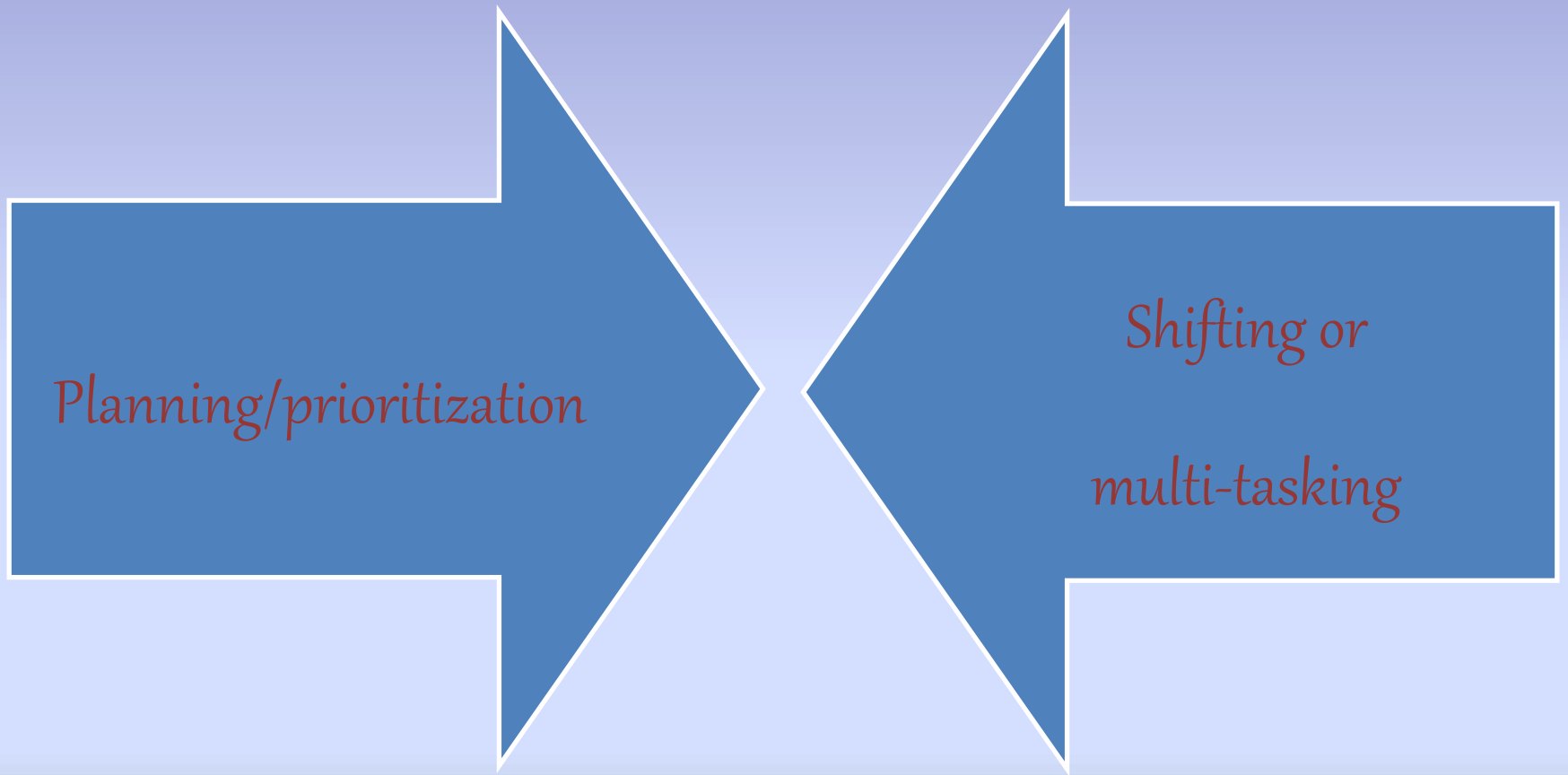
Grade 5

A need to know



We want to teach to observe how energy changes.

EXECUTIVE FUNCTION SKILLS



CALP (Content)

Matter

Mass

Volume

Density

Conductivity

Evaporation

Mixture

Magnetism

Combustion

Oxidation

Putrefaction

Filtration

Thermal

Energy

Heat

Potential

Cinetic

Mechanical

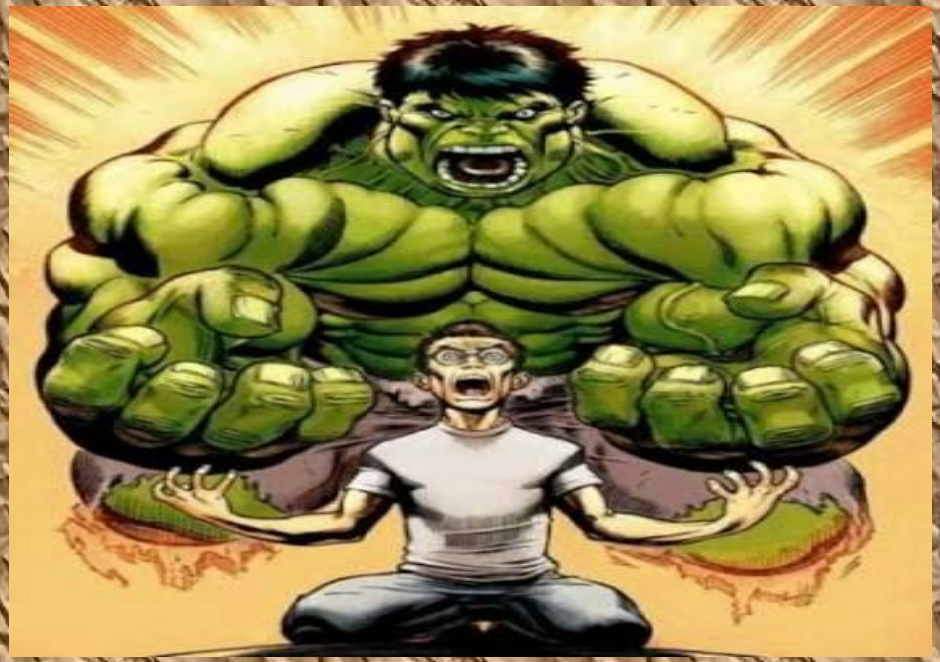
Electrical

Advance organizer

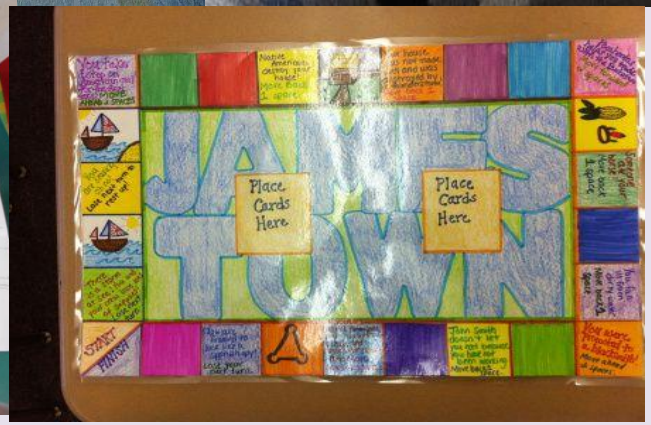
What different types of energy can we observe?

DRIVING QUESTION

What different kind of energy can we observe?



Introduction to the project: Exemplars




School
Markers
Schoo!!


QUIZOLOGY
TRADE A BODY PART!
REPORT CARD
GRADUATION!
RECESS (take a BREAK)
BACK 2 START
FREE BODY PART!

Teaching Sequence

- **Sesion 1**: Advance organizer (15 minutes) and introduce the first part of the unit "Matter and characteristics". Cooperative learning: Gallery walk
- INQUIRY: What is matter and what are some of its main characteristics?
- **Sesion 2**: Continue giving more background about materials and characteristics.
- **Sesion 3**: Start with the project. Hots: Analyze boardgames, components, size, colours, evaluate how to create a boardgame, create a draft of a boardgame.
- **Sesion 4**: Continue with experiments about matter. INQUIRY: What can we learn about matter by experimenting with it? Task Based Instruction: Presentation, Practice, Performance. " Make a boardgame with questions and answers"
- **Sesion 5**: Work about the "Types of energy" INQUIRY: How many forms of energy are there? Cooperative learning: Jigsaw
- **Sesion 6**: Work on part 2 "Transformations of energy" INQUIRY: What happens to energy when it's used? Problem Based learning: What would happen if we run out of all energy sources?
- **Sesion 7**: Check the progress.
- **Sesion 8**: Presentation of the project.

Hots

- **Analyze** *differents boardgames, colours, size, pictures...if they want to include puzzles, pictures or minigames.*
- **Evaluate** *Children have to think how to create a boardgame that includes all the information about energy and matter.*
- **Create** *A draft of a boardgame. They have to think what they want to include in it.*

Task-Based Instruction

1. Presentation : Teacher presents the task.
2. Practice: Students do the task
3. Production: Students share the task.

- 249 Bloom's Taxonomy on Critical Thinking (teach through)

BICs- Interpersonal language

- **Sentences for feedback**

I think

I suggest

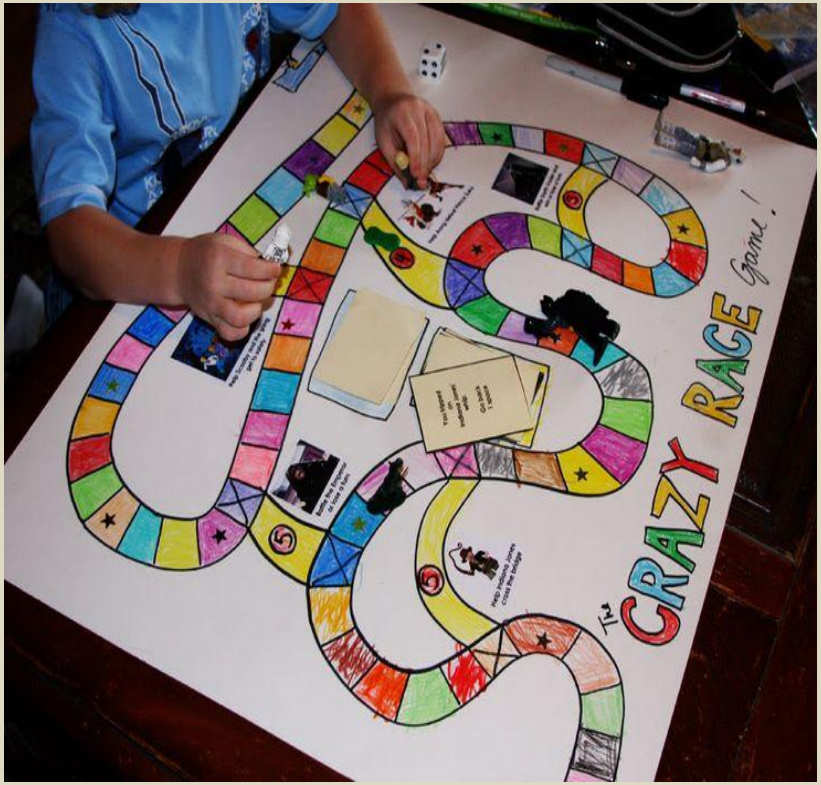
Maybe

You could

Modals: You need, you have to, you should...

Task:Make a boardgame with questions and answers

- 1. Presentation: Teacher presents the boardgame using the CALP and BICs.
- 2. Practice: Students will make a boardgame with questions and answers using the calp and BICs in groups.
- 3. Performance: Students will play with other group's boardgames using the CALP and BICs.



Checklist for Human size boardgame

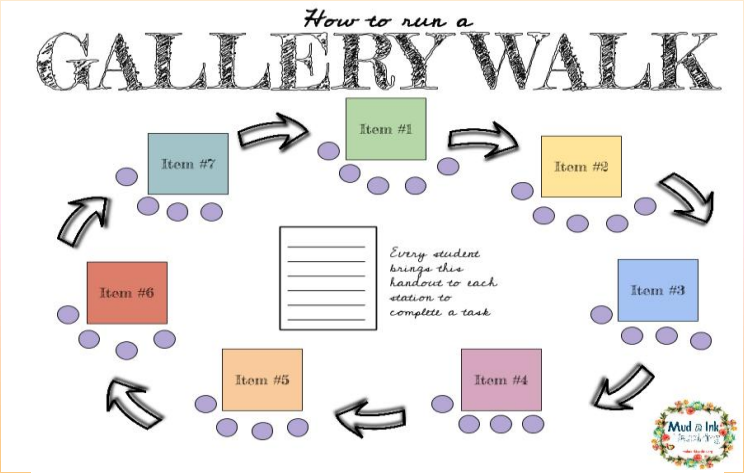
- Task 1: Pick a game style (Wikipedia/ List of boardgames)
- Task 2: Sketch the board and the rules.
- Task 3: Build the boardgame according to picked game related to a topic.
- Task 4: Make the pieces (dice,...
- Task 5: Make the playing cards.
- Task 6 : Present the human size boardgame.

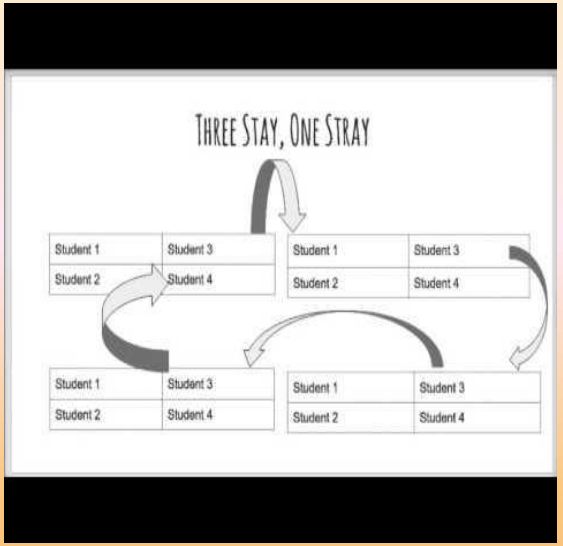
Cooperative Learning

- Gallery walk
- Roundtable
- Structuredd Problem Solving
- Three stay-One Stray
- Inside outside circle
- Spend-A-Buck
- Think Pair Share
- Jigsaw
- Send/Pass a problem
- Round Robin
- Showdown
- Talking Chips

Dr. Kagan: Cooperative Learning Structures

Differentiation:
Content
Process
Product

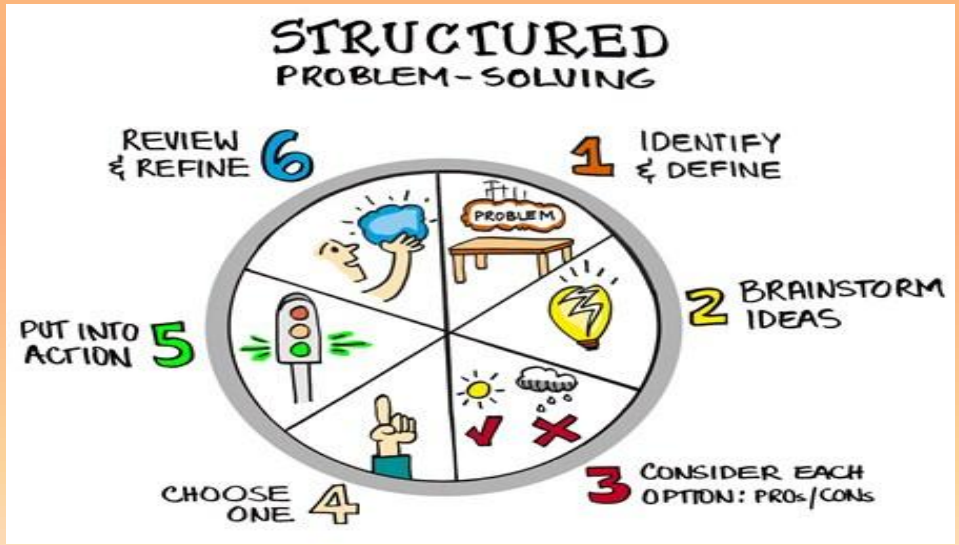


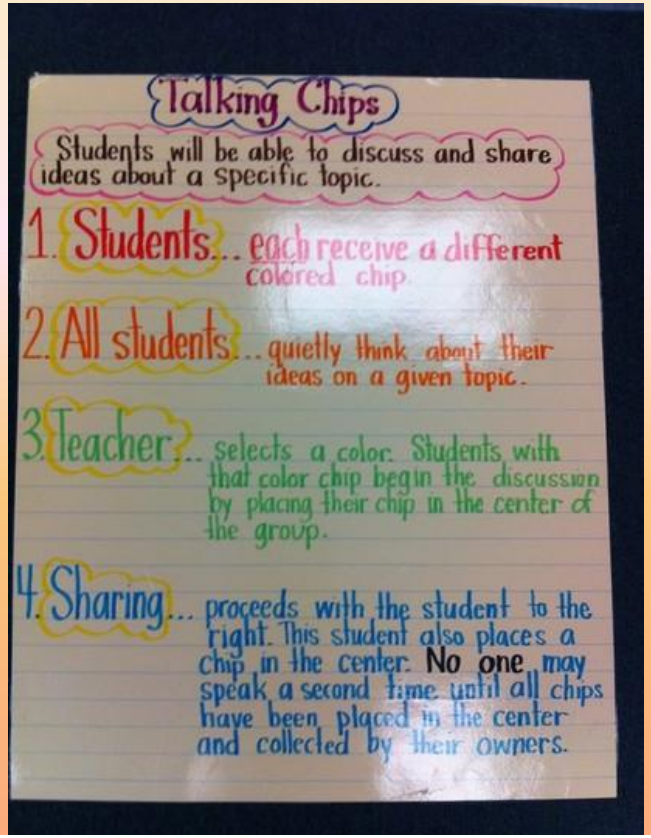


2. Jigsaw in steps

1. Divide the class into groups of three to five people.
2. Every student in group was given different assignment.
3. Students with the same assignment form the new team (expert group)
4. After the expert groups finished the discussion, each of them return to his/her home group and explain their assignment to the team.
5. Each expert group presents his/her discussion's outcome
6. Teacher gives evaluation
7. Closing

cooperativelearningresources.weebly.com





Send / Pass a Problem

- Each group identifies a problem or issue to solve or discuss. This is written on the front of a folder or envelope.
- Within a given time limit, each group prepares responses to the problem or issue, writing them on a single sheet of paper.
- At the signal, the sheet is placed in the folder and forwarded to the second group.

ROUND ROBIN

1. **Teacher poses the question.**
2. **Think time.**
3. **Your team takes turns verbally giving responses.**

Inside/Outside Circle

(Teacher Directed)

- Students stand in two circles – inside circle faces out, outside circle faces in
- Each student has a partner
- Teacher poses a **question**
- Students **work together** to make sure each knows the answer (**seeking coaching** from a neighboring pair, if needed)
- Teacher solicits a **choral response** from either inside circle, outside circle or the whole class

#Name _____ Date _____

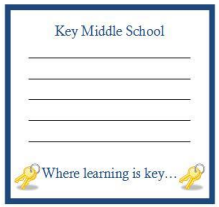
THINK, PAIR, SHARE

Question or topic: _____

What I think....	What my partner thinks..	What we will share....

SHOW DOWN

- Teacher or teammate **reads** a question **aloud**
- Students work or think **independently**
- Teacher calls "Show Down!"
- Students **show** answer



Problem-Based Learning

- It's a problem teachers have to invent or pose in order to teach something...

WHAT WOULD HAPPEN IF WE RUN OUT OF ALL THE ENERGY SOURCES?

Benchmarks and Checklist

- Completed a draft of a boardgame with the rules, included the title of the gameboard, the design, how they have to play the game:.....
- Created the boardgame in human size using different materials, paying attention to the design, the pictures and the pieces to move or to go back:....
- Wrote the playing cards related to matter and energy mixing questions and answers, minigames, pictionary cards, ...
- Prepared the presentation of the boardgame explaining the rules and the aim of the game:....

Project- Based Learning

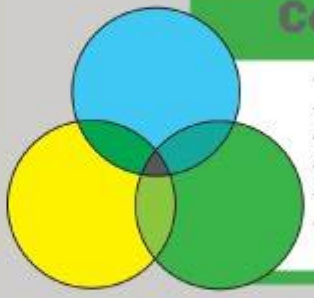
- A need to know.
- Driving question.
- Voice and choice
- 21st Century Skills.
- Inquiry + Innovation.
- Feedback+Revision.

21st Century Skills

Metro 4Cs Rubric Performance Areas

Critical Thinking

- Information & Discovery
- Interpretation & Analysis
- Reasoning
- Constructing Arguments
- Problem Solving
- Systems Thinking



Collaboration

- Leadership & Initiative
- Cooperation
- Flexibility
- Responsibility & Productivity
- Collaborate Using Digital Media
- Responsiveness & Constructive Feedback

Communication

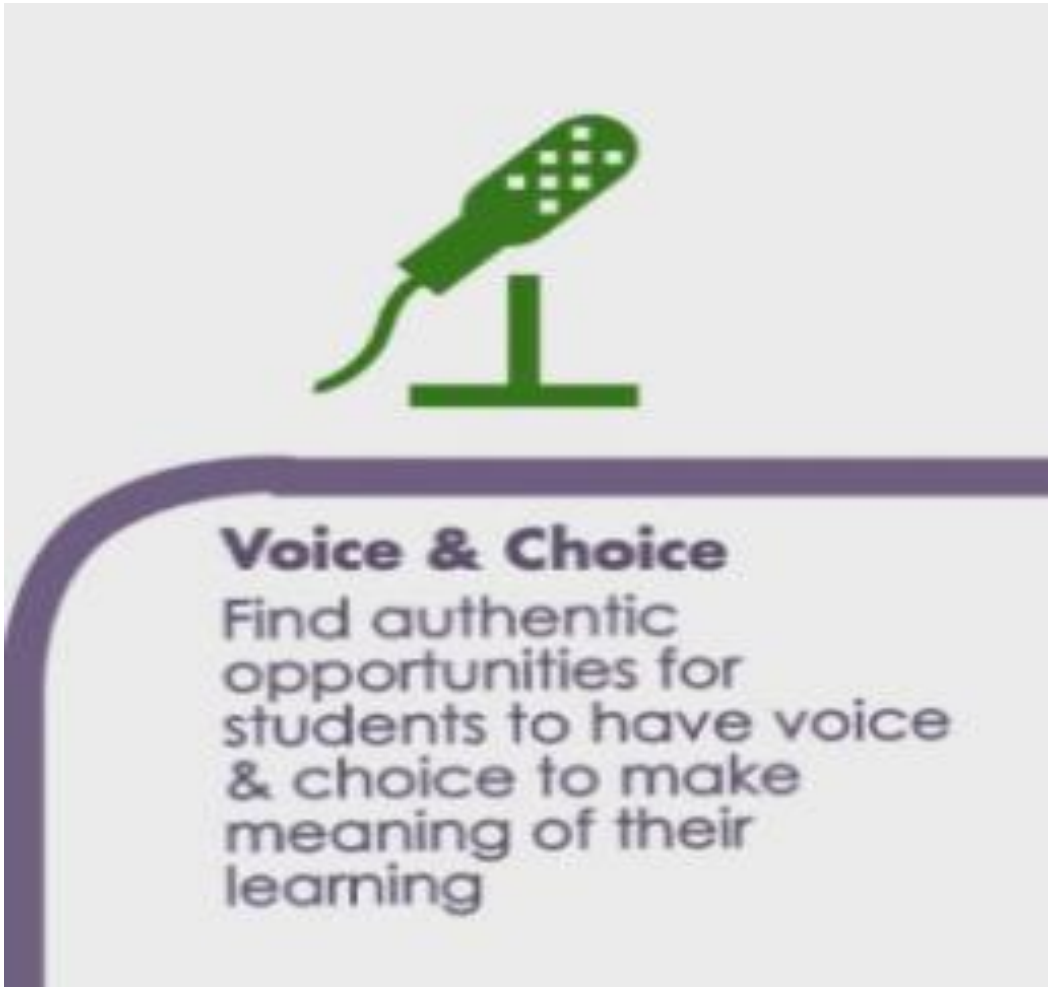
- Effective Listening
- Delivering Oral Presentations
- Communicate Using Digital Media
- Engaging in Conversations & Discussions
- Communicating in Diverse Environments

Writing to:

- Inform
- Support an Argument With Claims
- Engage and Entertain

Creativity

- Idea Generation
- Idea Design & Refinement
- Openness & Courage to Explore
- Work Creatively with Others
- Creative Production & Innovation


Voice & Choice
Find authentic opportunities for students to have voice & choice to make meaning of their learning

Rubrics

Mind Map Rubric

	5 	4 	3 	2 	1 
Neatness and Presentation 	The mind map was well presented and all the information is easy to understand	The mind map was well presented and most of the information is easy to understand	The mind map was mostly well presented but some of the information was difficult to understand	The mind map was not neat enough to understand most concepts	The mind map was not neat enough to understand
Use of images/symbols 	Most categories are enhanced with simple symbols or diagrams	Some categories are enhanced with simple symbols or diagrams	A few categories are enhanced with simple symbols or diagrams	The mind map includes some images	The mind map includes a few images
Use of colour 	Has included colour to show all connections and/or to categorise topics throughout the mind map	Has included colour to demonstrate some connections and or topics throughout the mind map	Has included some colour in the mind map but has not used colour to categorise throughout the mind map	Has used very little colour in the mind map and has not used colour to categorise throughout the mind map	Has failed to include colour in the mind map

I would use this rubric and I would change the categories adapting the rubric to a boardgame