



Derived Social Modeling of Spatial Perspective via Relational Triangulation

Paul Guinther, Ph.D.

With thanks to Nic Hooper, Ph.D. & Chelsea Walden for data collection

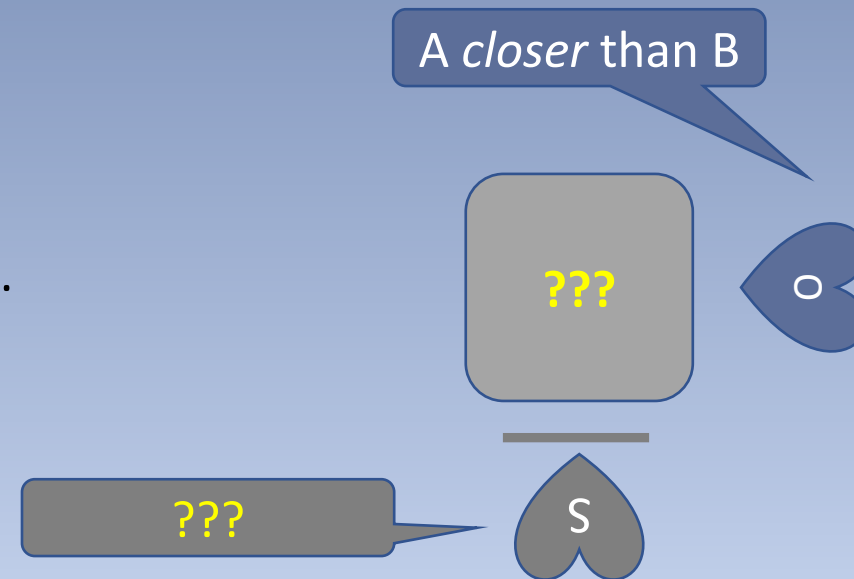
Presented at 16th ACBS World Conference, July 2018, Montreal

Study Aim

- Bring derived social modeling of spatial perspective under contextual control
 - In verbally competent neurotypical adults
 - Using operant match-to-sample training and testing procedures
 - Relational Triangulation Perspective Taking Protocol (RT-PTP; Guinther 2017)

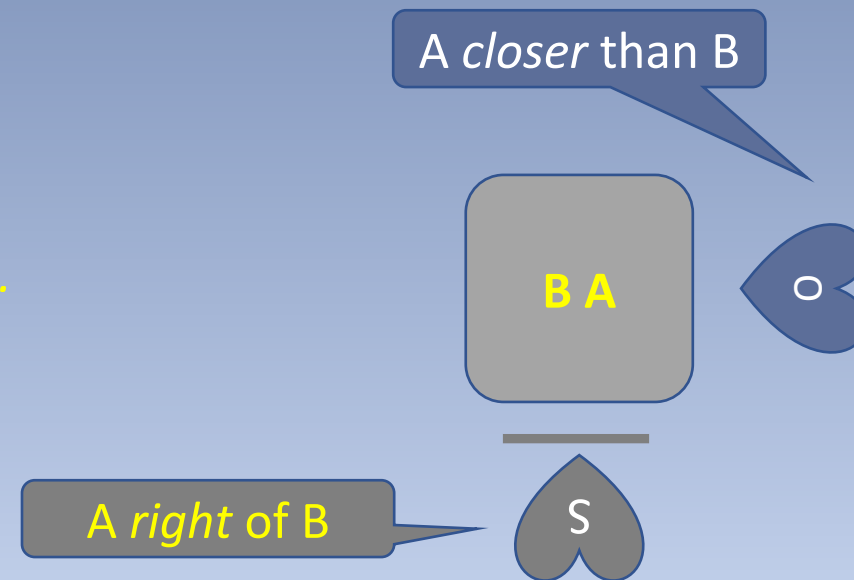
Derived Modeling of Spatial Perspective

- You are sitting blindfolded at a square table that seats four. On top of the table are an apple and a banana.
- A person seated to your *right* says “The apple is *closer* than the banana.” What should you say?
 - The apple is closer than the banana.
 - The apple is further than the banana.
 - The apple is to the left of the banana.
 - The apple is to the right of the banana.



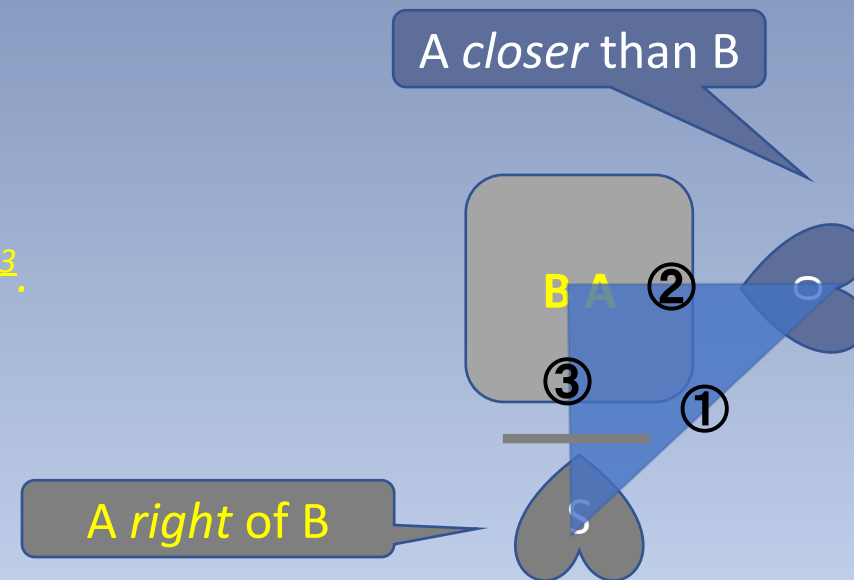
Derived Modeling of Spatial Perspective

- You are sitting blindfolded at a square table that seats four. On top of the table are an apple and a banana.
- A person seated to your *right* says “The apple is *closer* than the banana.” What should you say?
 - The apple is closer than the banana.
 - The apple is further than the banana.
 - The apple is to the left of the banana.
 - *The apple is to the right of the banana.*

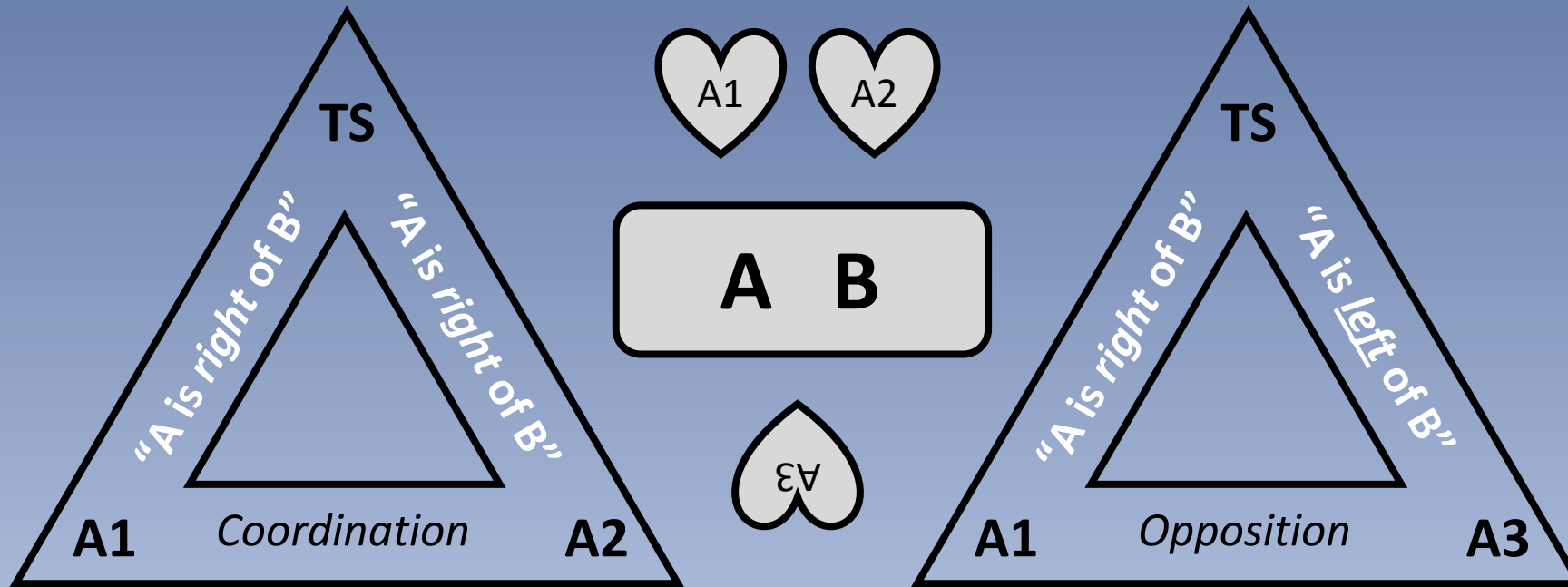


Derived Modeling of Spatial Perspective

- You are sitting blindfolded at a square table that seats four. On top of the table are an apple and a banana.
- A person seated to your right¹ says “The apple is closer than the banana².” What should you say?
 - The apple is closer than the banana.
 - The apple is further than the banana.
 - The apple is to the left of the banana.
 - The apple is to the right of the banana³.



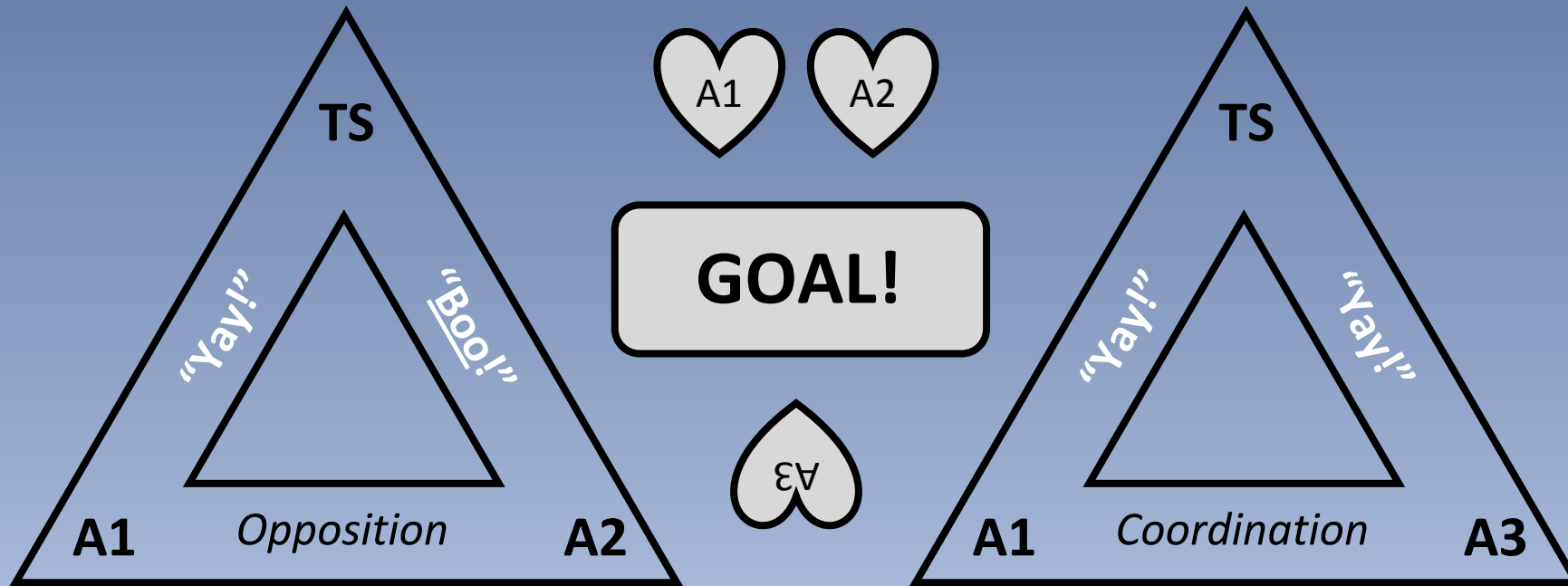
Spatial Relational Triangles



Same Spatial Alignment
(Same Pointing Origin)
(Facing Same Target)

Different Spatial Alignment
(Different Pointing Origin)
(Facing Same Target)

Material Relational Triangles



Different Material Alignment

(Act Opposite Ways)

e.g., Opponents

Same Material Alignment

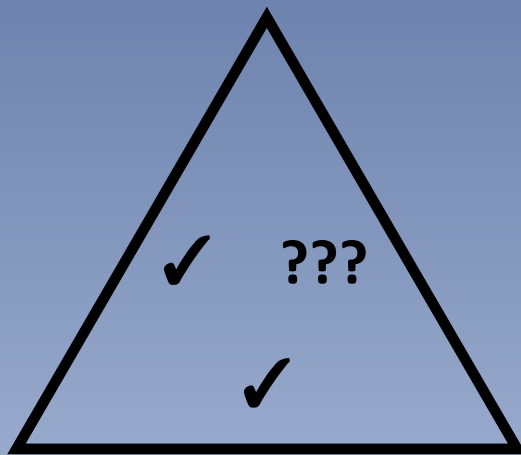
(Act Same Way)

e.g., Teammates

Relational Triangulation Framework

Guinther (JEAB, 2017; in press)

TARGET STIMULI

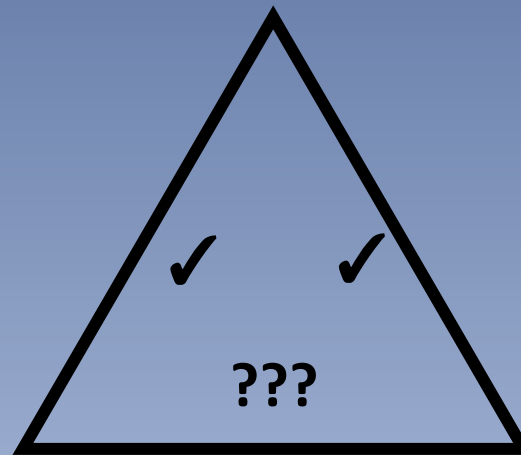


SELF OTHER

Derived
Perspective Taking

How will they act?

TARGET STIMULI

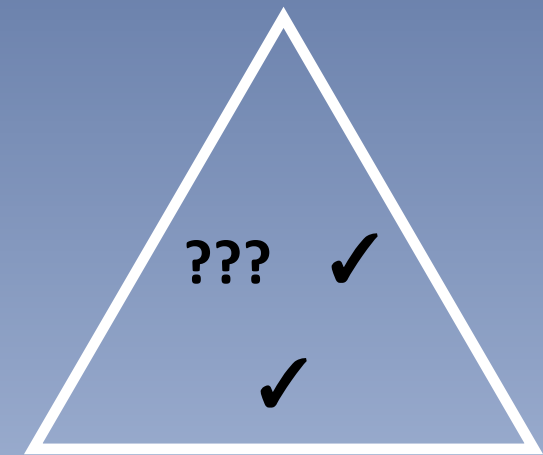


SELF OTHER

Derived
Aligning

How do we act?

TARGET STIMULI



SELF OTHER

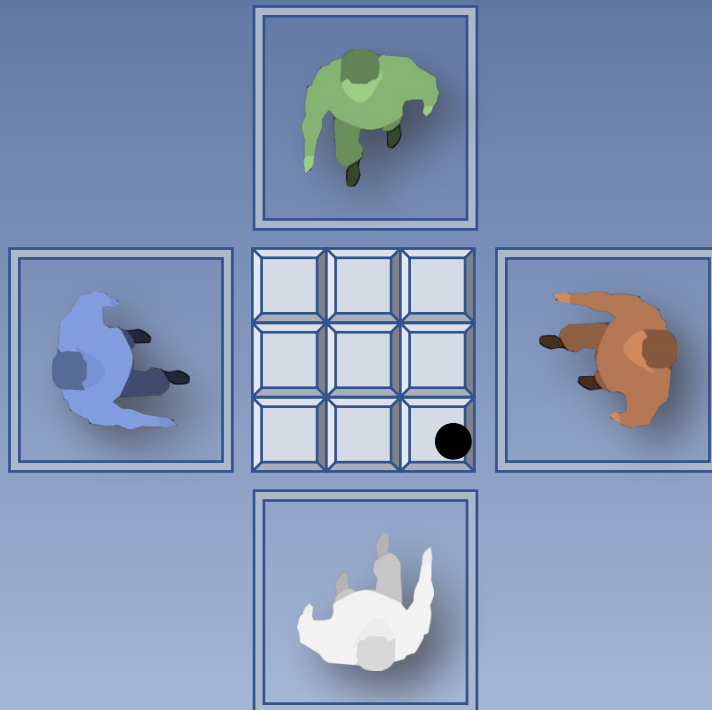
Derived
Modeling

How should I act?

Where is the black beacon?

7	8	9	YONDER
4	5	6	THERE
1	2	3	HERE

LEFT
CENTER
RIGHT



Study Phase 1: Train relative deictic pointing

Where is the black beacon?

7	8	9	YONDER
4	5	6	THERE
1	2	3	HERE

LEFT
CENTER
RIGHT

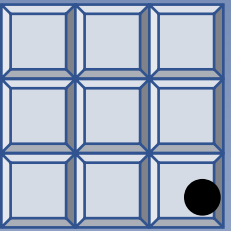
3	2	1
6	5	4
9	8	7

Yonder Left (K^7)



Yonder Right (K^9)

1	4	7
2	5	8
3	6	9



9	6	3
8	5	2
7	4	1

Here Left (K^1)



Here Right (K^3)

7	8	9
4	5	6
1	2	3

Level: 1

A, S, D



A



S



D



Relational Triangulation Perspective Taking Protocol (RT-PTP; Guinther, 2017)

A S D

LEFT
CENTER
RIGHT

Level: 1

A, S, D



A



S



D



A S D
LEFT
CENTER
RIGHT

Level: 1

A, S, D



A



S



D



A S D
LEFT CENTER RIGHT

Level: 1

A, S, D



A



S



D





X3



A3



LEFT
CENTER
RIGHT

Level: 1

A, S, D



A



S



D





X3



A3

A S D
LEFT CENTER RIGHT

Level: 1

A, S, D



A



S



D

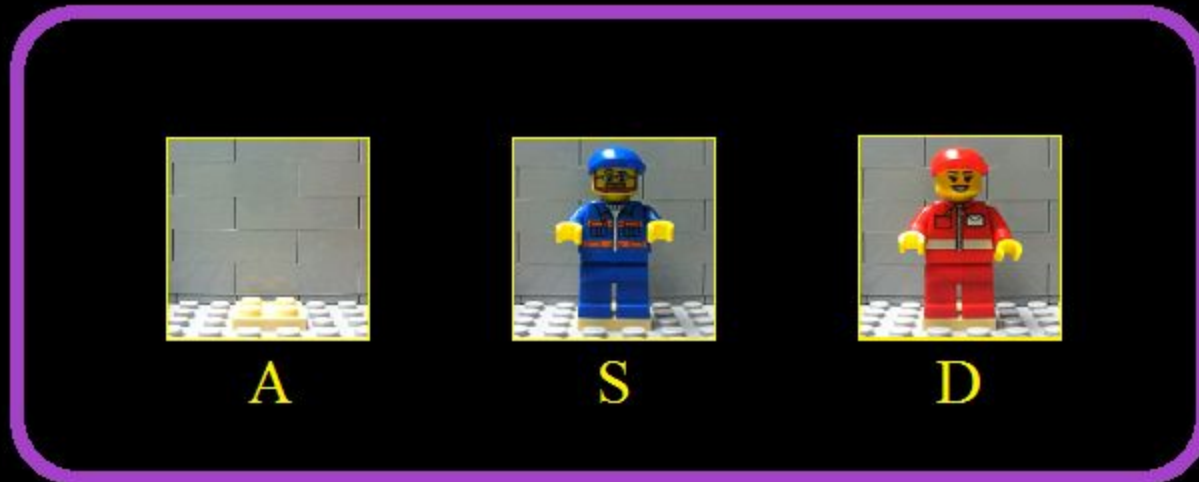




A S D
LEFT
CENTER
RIGHT

Level: 1

A, S, D



X2

X3



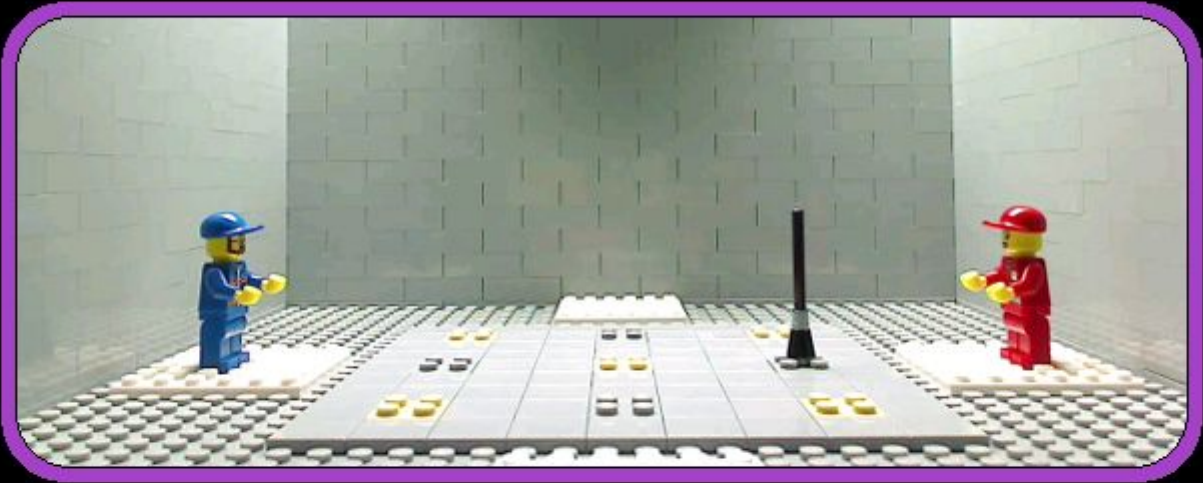
7	8	9
4	5	6
1	2	3

YONDER
THERE
HERE

LEFT
CENTER
RIGHT

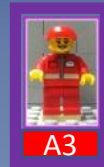
Level: 12

1-9



X2

X3



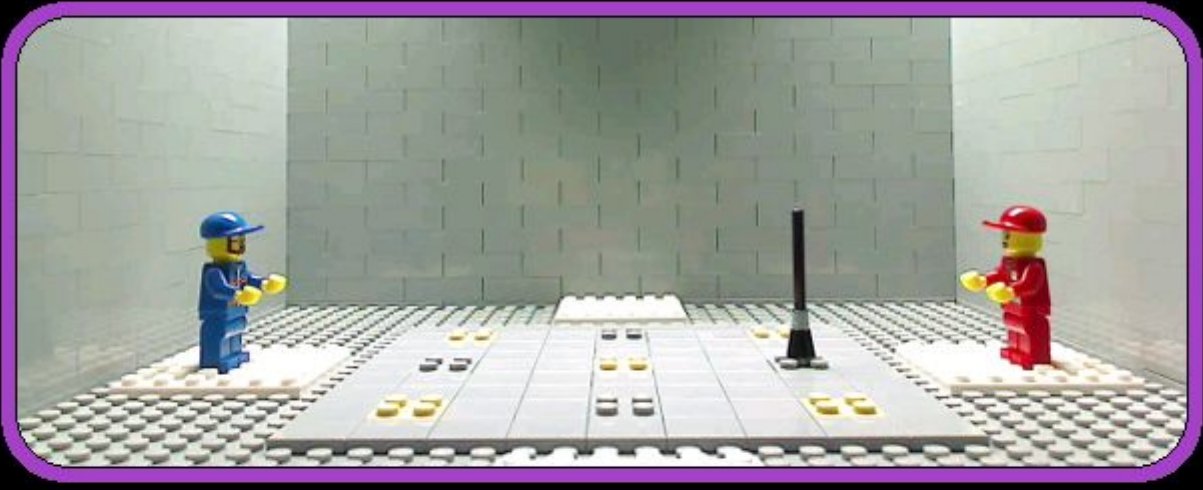
7	8	9
4	5	6
1	2	3

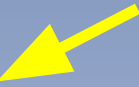
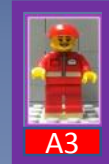
LEFT
CENTER
RIGHT

YONDER
THERE
HERE

Level: 12

1-9





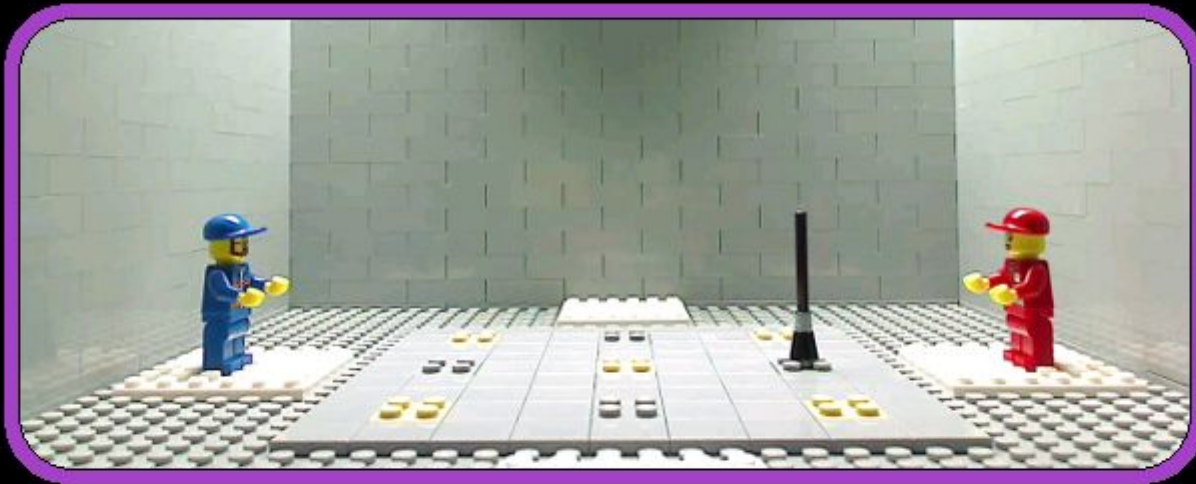
7	8	9
4	5	6
1	2	3

LEFT
CENTER
RIGHT

YONDER
THERE
HERE

Level: 12

1-9





7	8	9
4	5	6
1	2	3

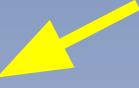
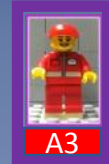
LEFT
CENTER
RIGHT

YONDER
THERE
HERE

Level: 12

1-9





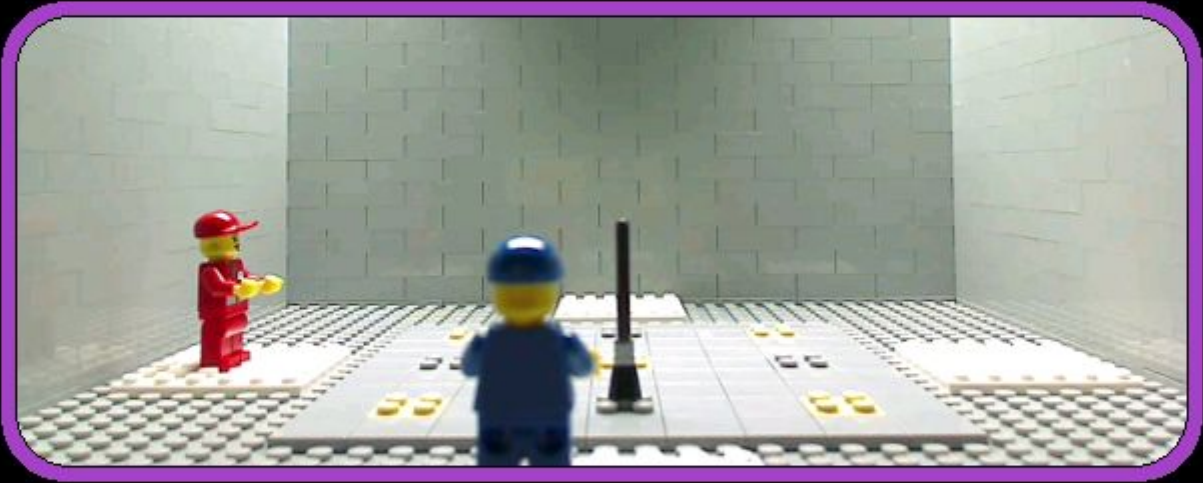
7	8	9
4	5	6
1	2	3

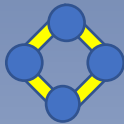
YONDER
THERE
HERE

LEFT
CENTER
RIGHT

Level: 12

1-9





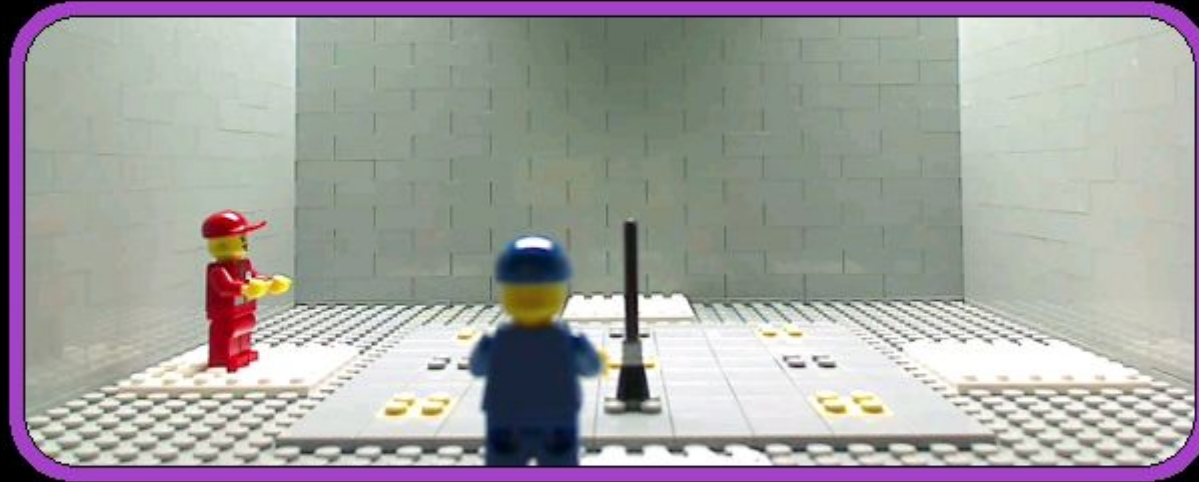
7	8	9
4	5	6
1	2	3

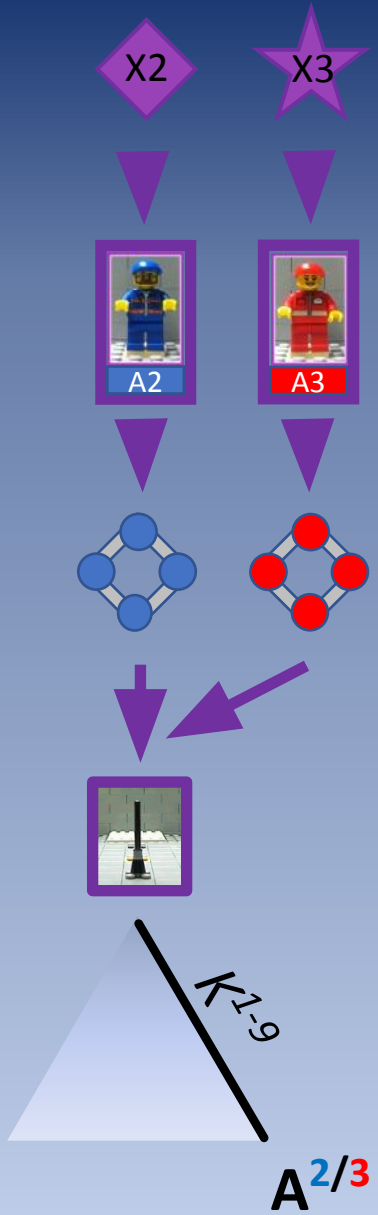
YONDER
THERE
HERE

LEFT
CENTER
RIGHT

Level: 12

1-9





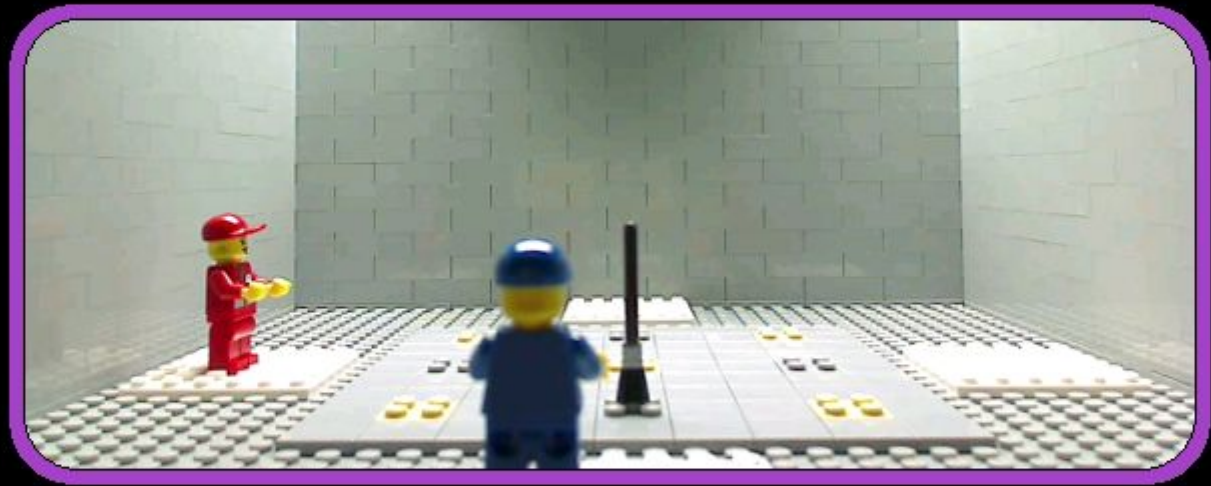
7	8	9
4	5	6
1	2	3

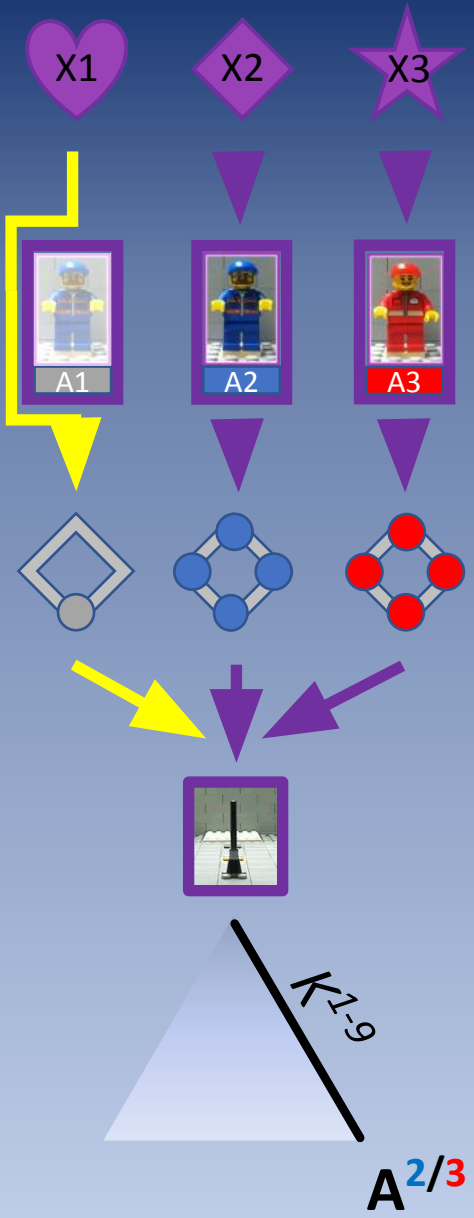
LEFT
CENTER
RIGHT

YONDER
THERE
HERE

Level: 12

1-9





7	8	9
4	5	6
1	2	3

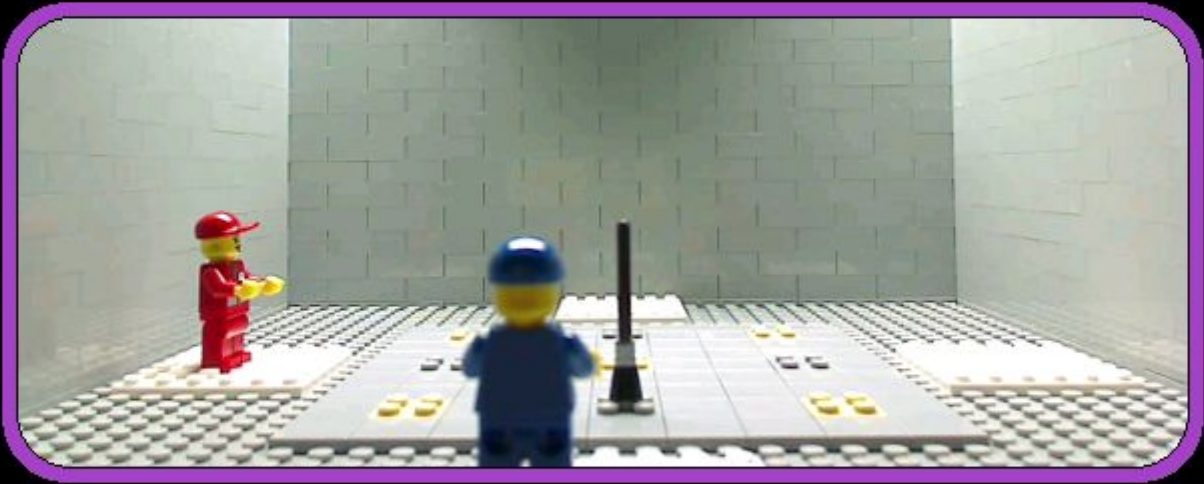

YONDER
THERE
HERE

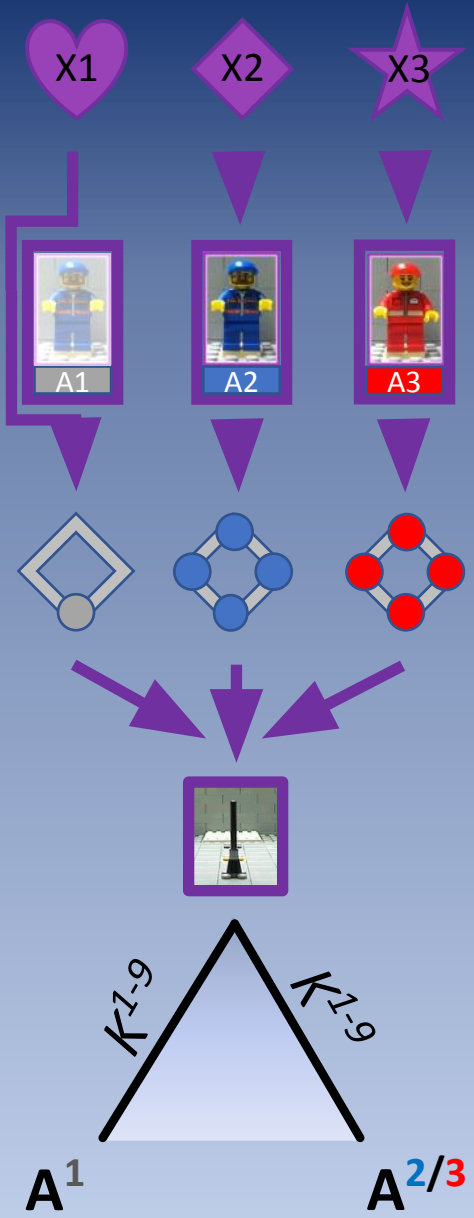
Level: 12

1-9

LEFT
CENTER
RIGHT

♥




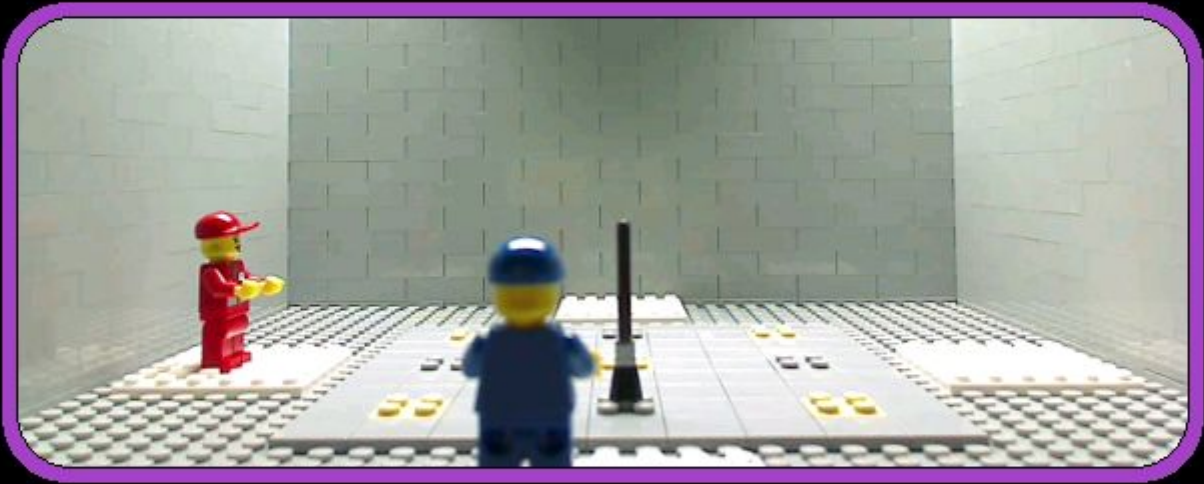

7	8	9
4	5	6
1	2	3

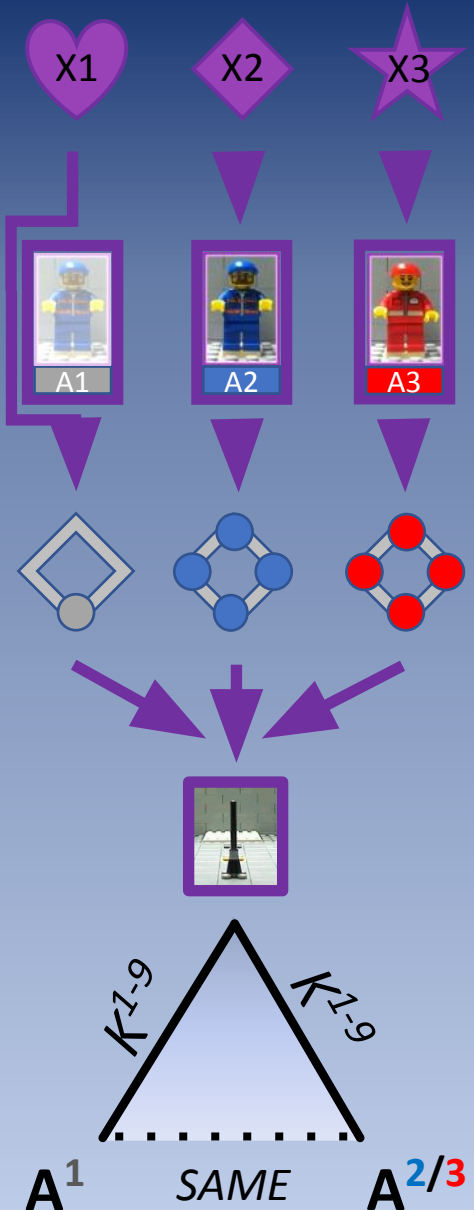
YONDER
THERE
HERE

Level: 12

1-9

LEFT
CENTER
RIGHT



7	8	9
4	5	6
1	2	3


YONDER
THERE
HERE

Level: 12

1-9

LEFT
CENTER
RIGHT

♥




V B N M

Which side of the black figure is facing you?

FRONT
BACK
LEFT
RIGHT



V B N M

Which side of the black figure is facing you?

FRONT

BACK

LEFT

RIGHT

F B L R
V B N M

His Left (K^N)



His Back (K^B)

F B L R
V B N M



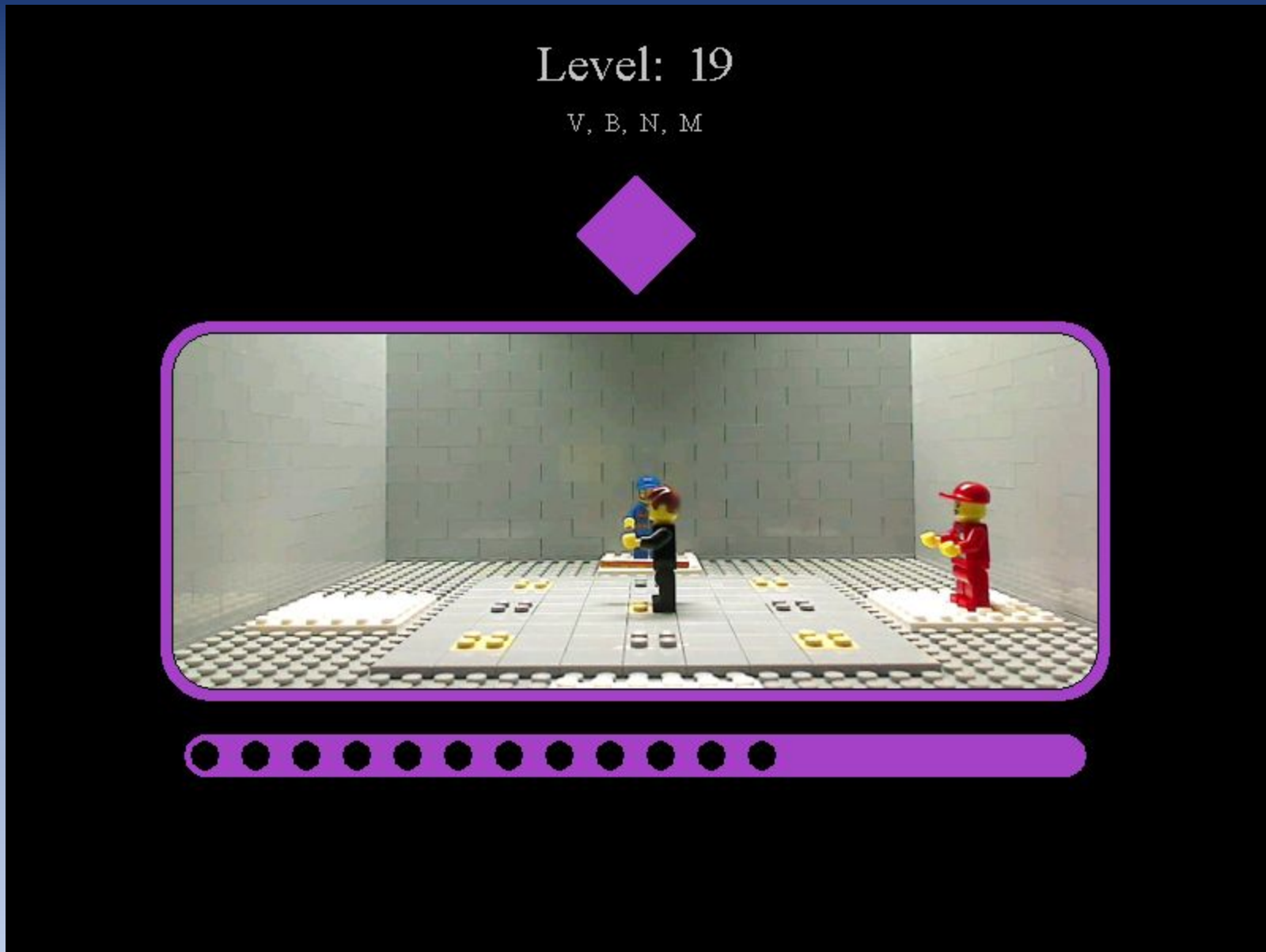
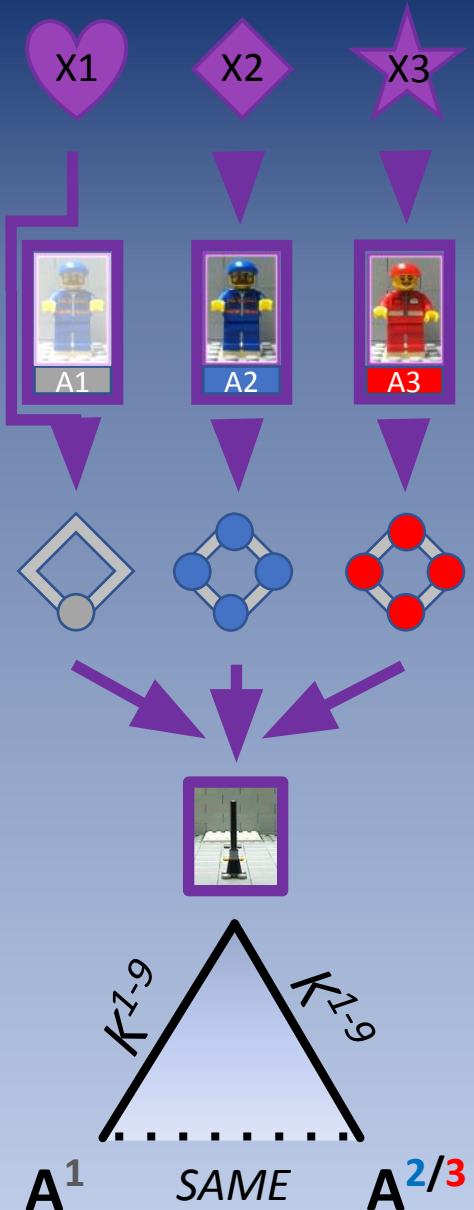
F B L R
V B N M

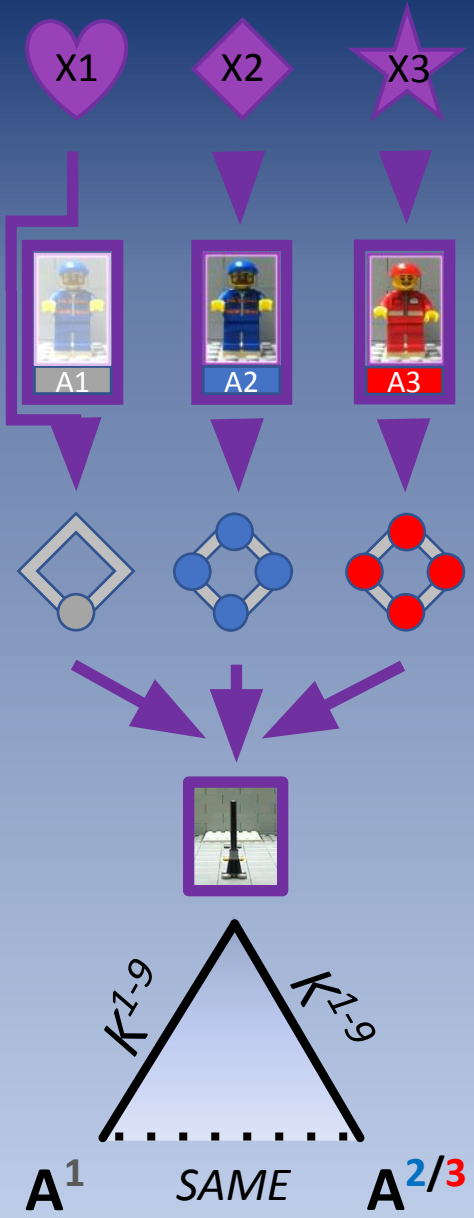
His Front (K^V)

His Right (K^M)

F B L R
V B N M



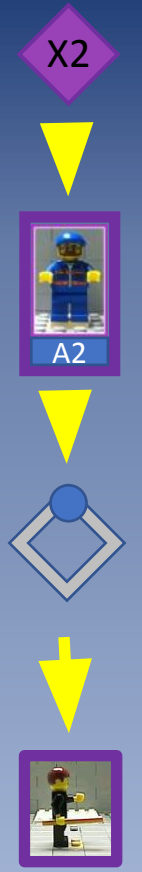


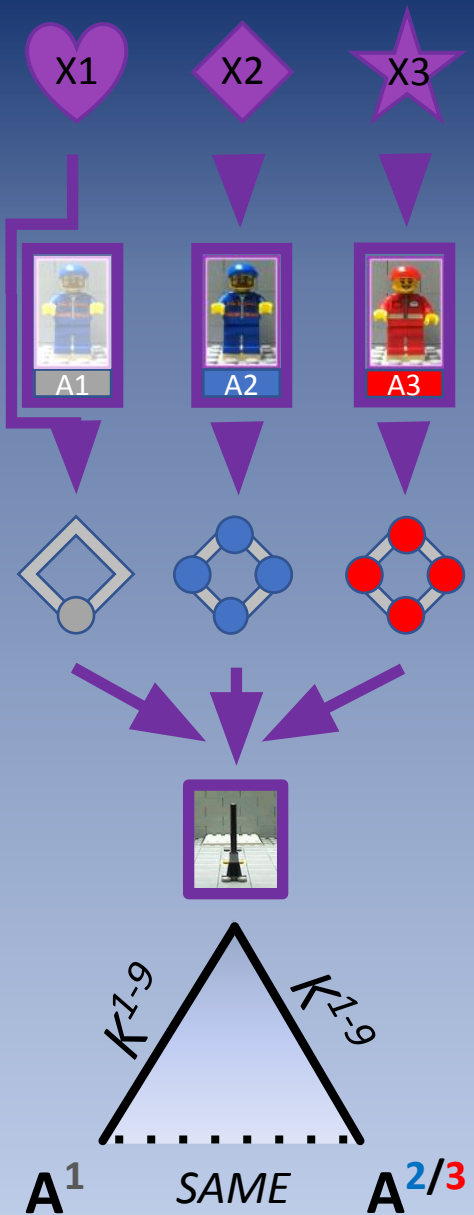


Level: 19
V, B, N, M

FRONT BACK LEFT RIGHT

V B N M



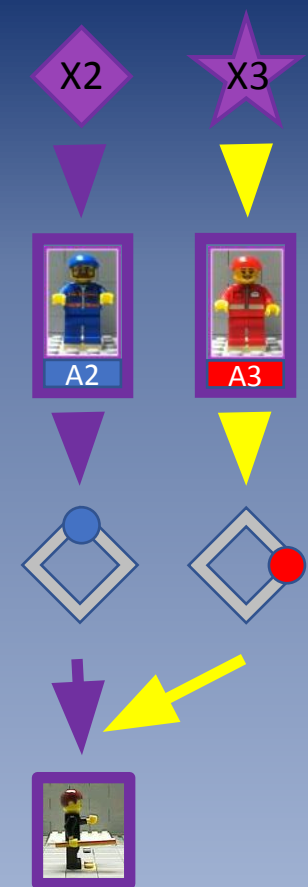


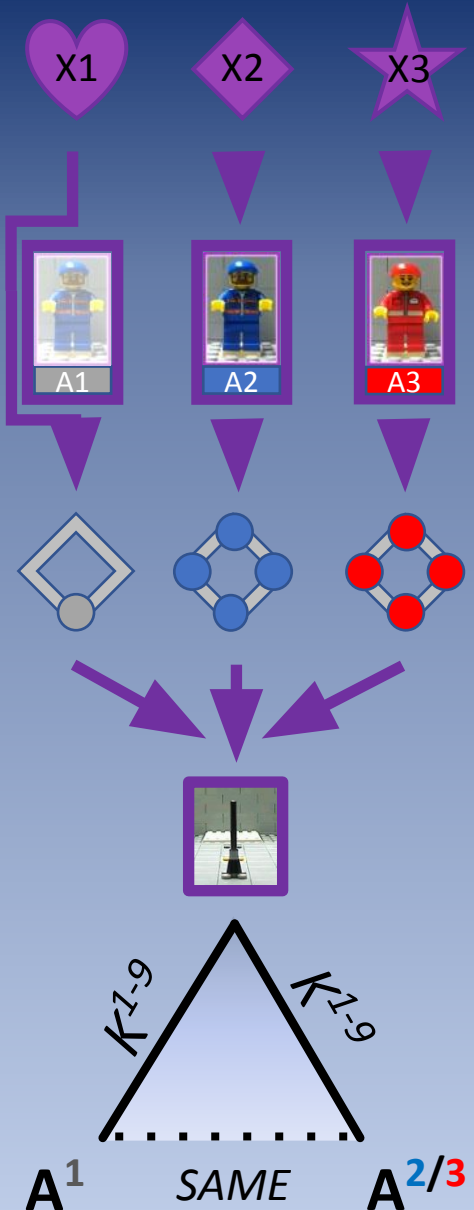
Level: 19
V, B, N, M

FRONT BACK LEFT RIGHT



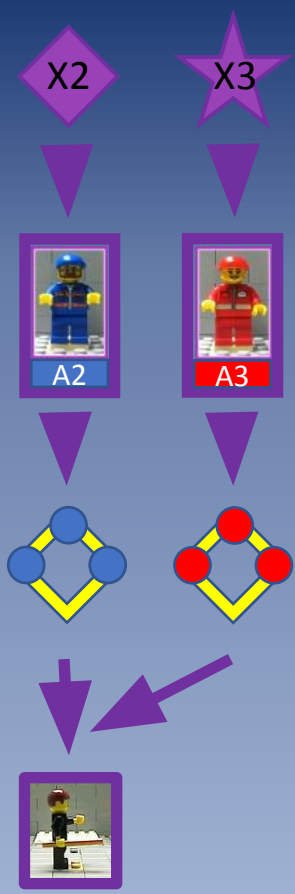

A progress bar at the bottom consists of 12 black dots followed by a solid purple bar.

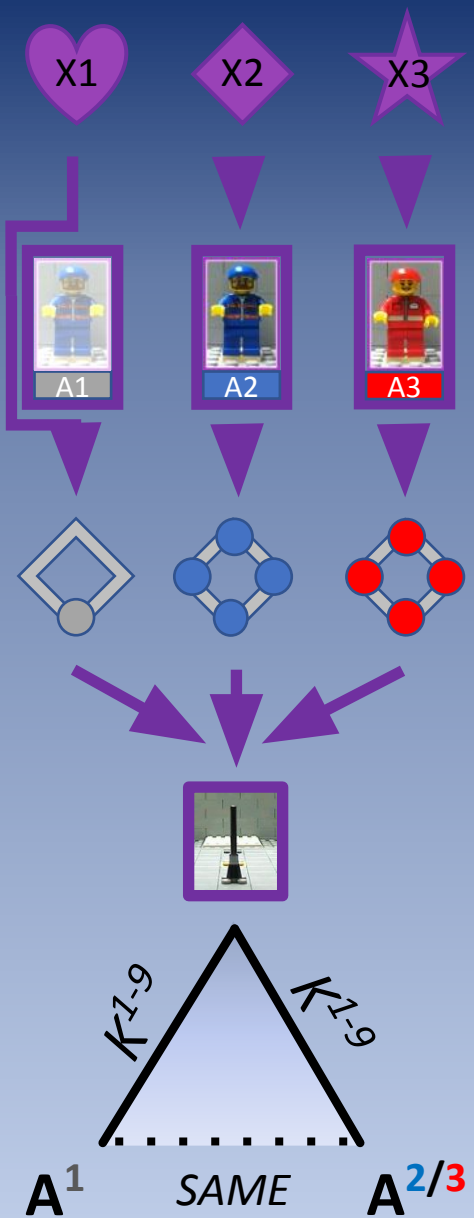




Level: 19
V, B, N, M

V B N M
FRONT BACK LEFT RIGHT





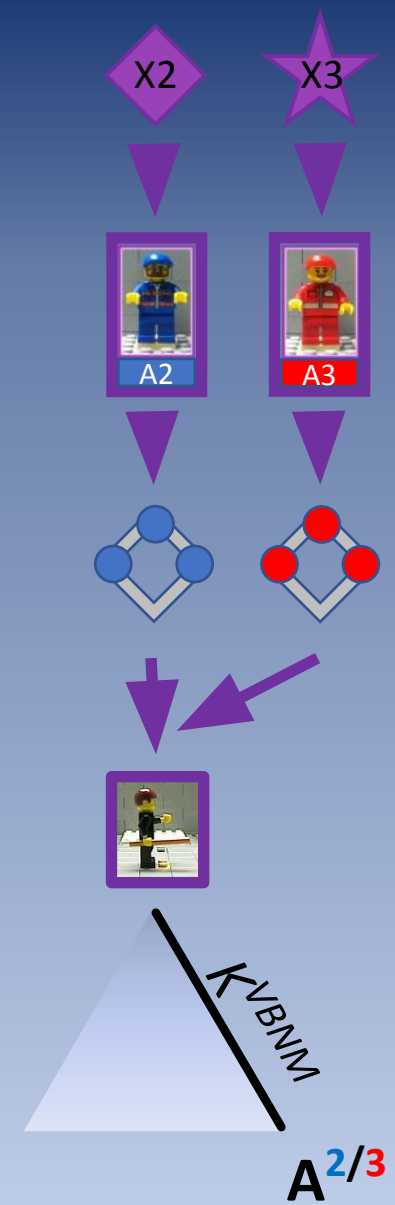
Level: 19
V, B, N, M

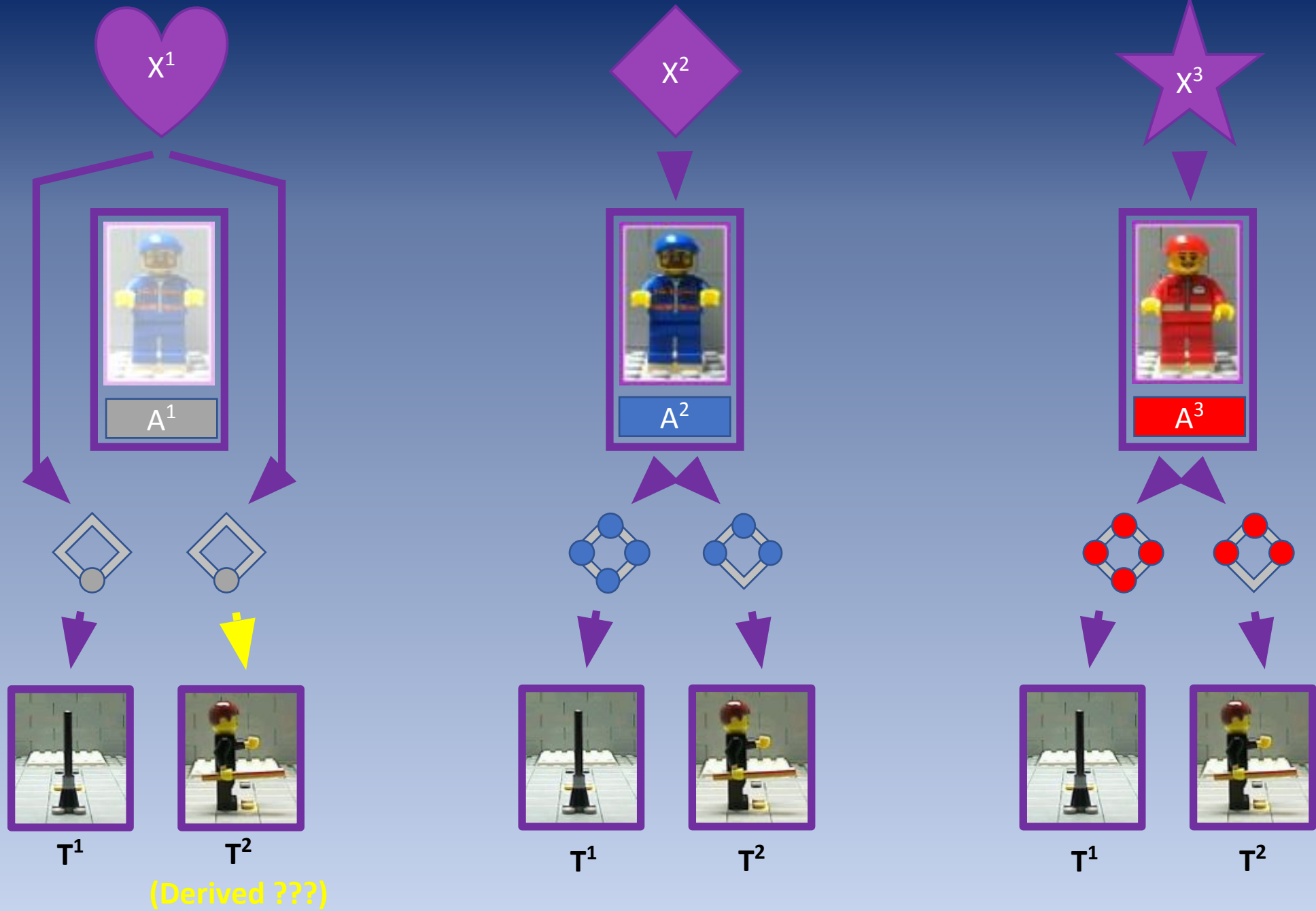
FRONT BACK LEFT RIGHT

V B N M

Diagram illustrating the game level interface:

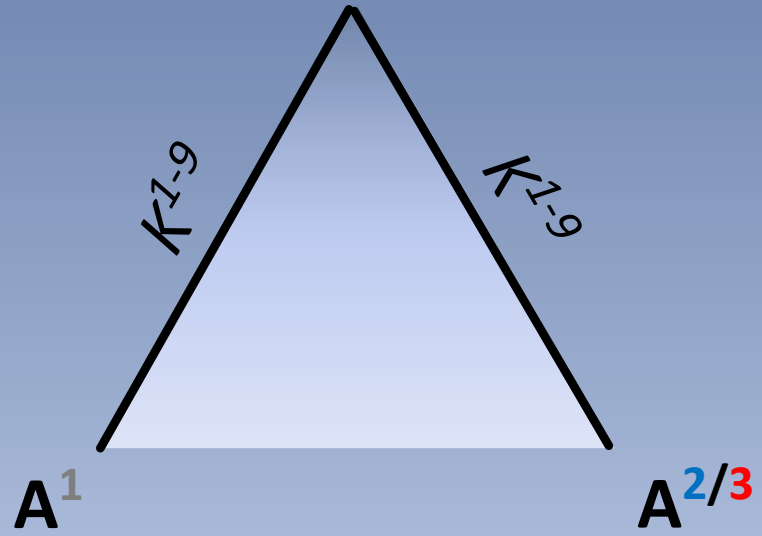
- Level: 19
- Agents: V (Blue), B (Blue), N (Black), M (Red)
- Directions: FRONT, BACK, LEFT, RIGHT
- Knowledge elements: V, B, N, M
- Central image: A large purple star.
- Gameplay area: A room with three agents (A1, A2, A3) and a large purple star.
- Progress bar: A purple bar with 12 dots.



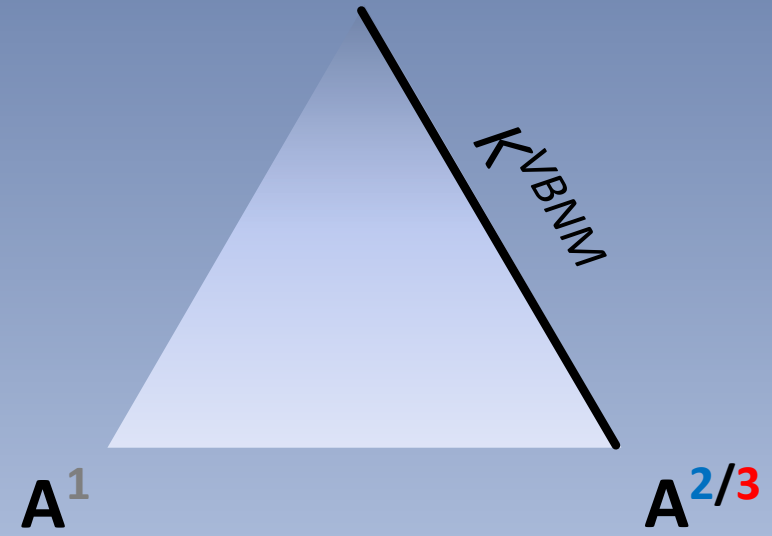




T^1

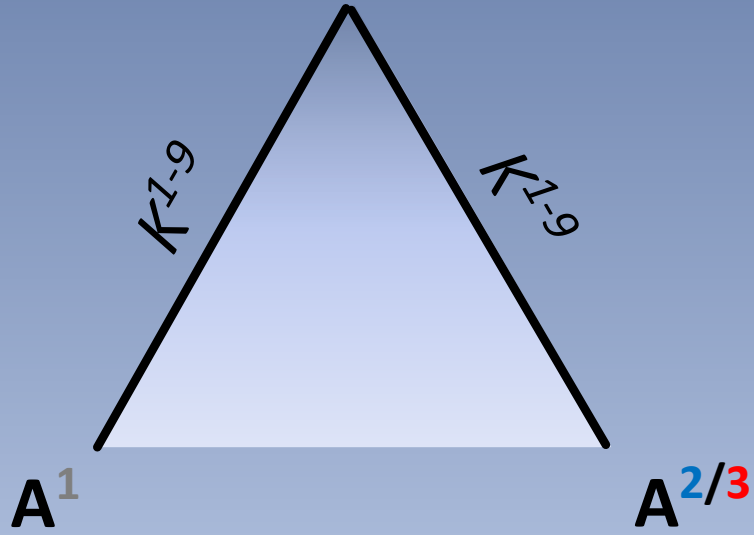


T^2

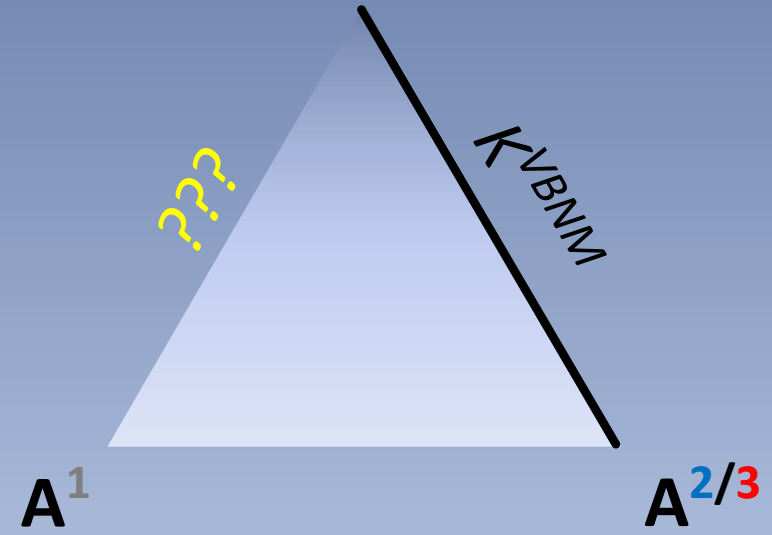




T¹

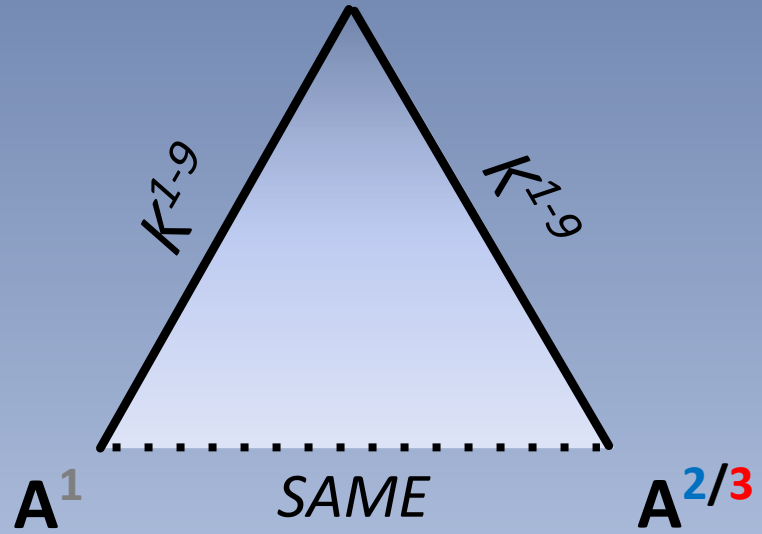


T²

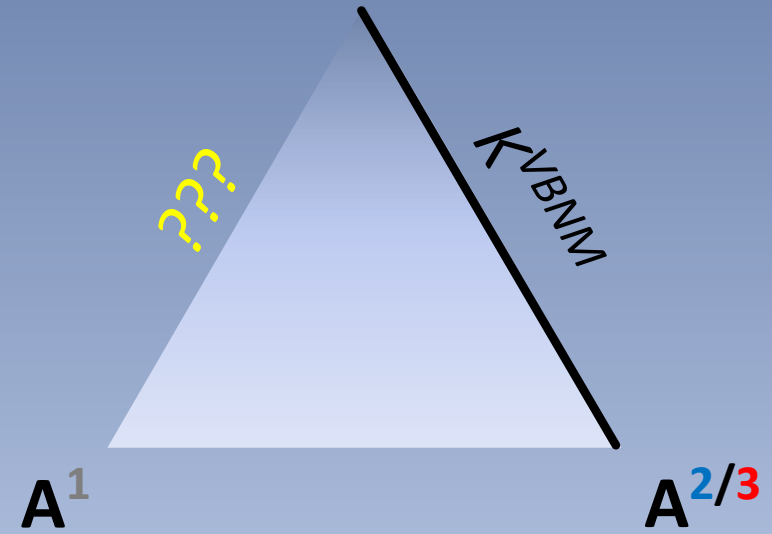




T^1

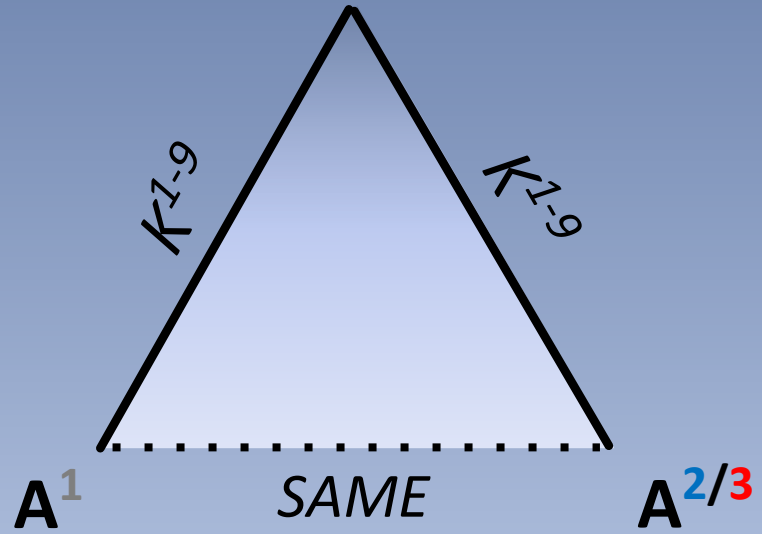


T^2

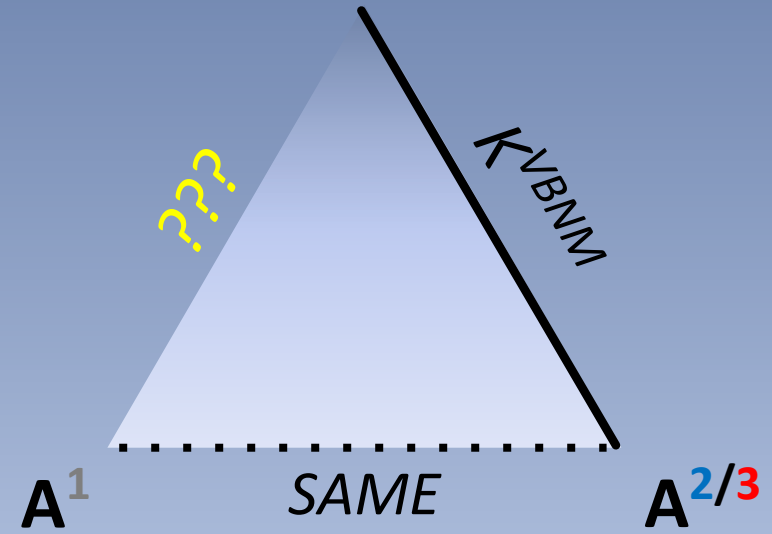




T^1

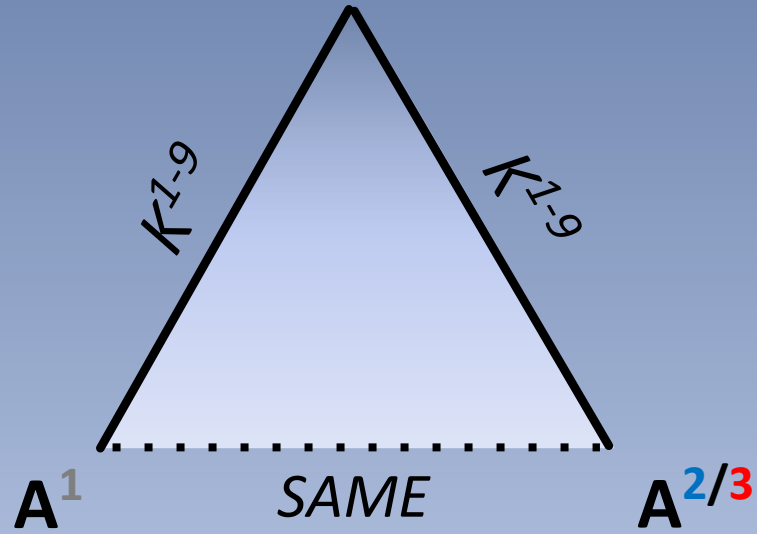


T^2

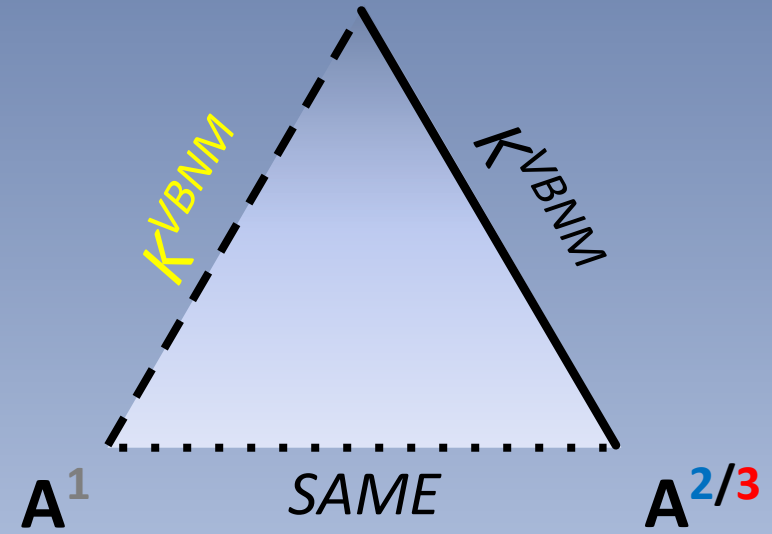


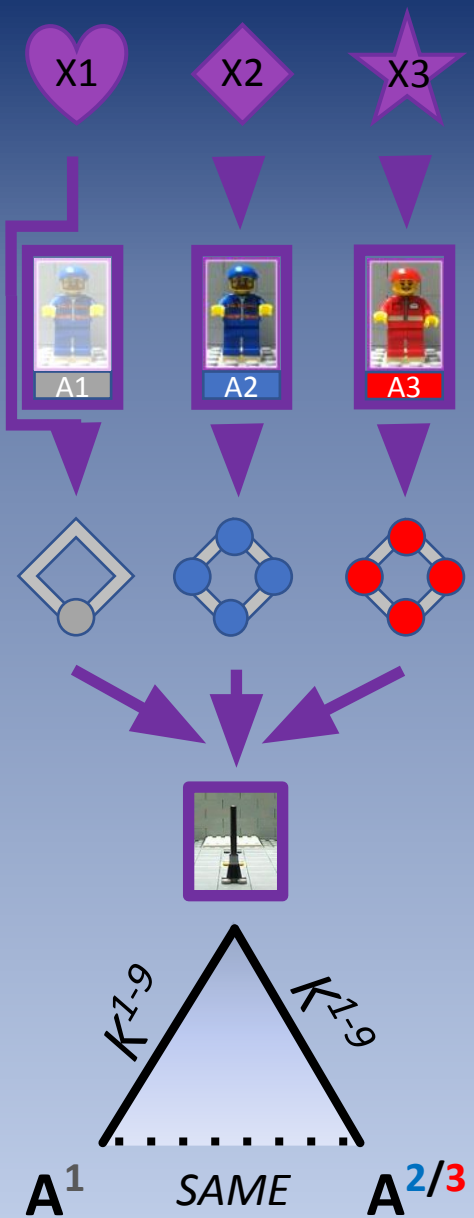


T^1



T^2





Feedback Off!

Level: 22

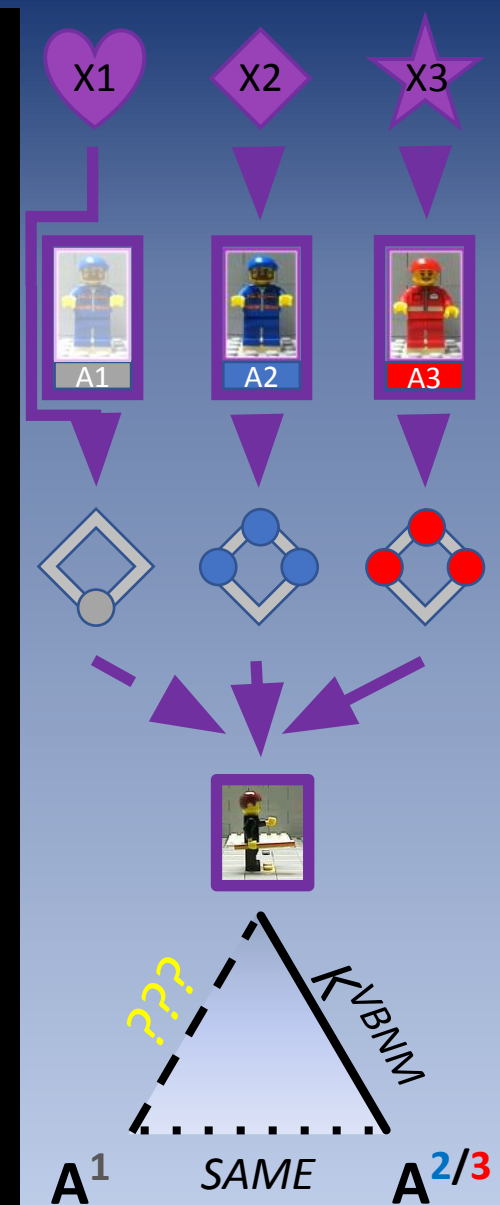
V, B, N, M

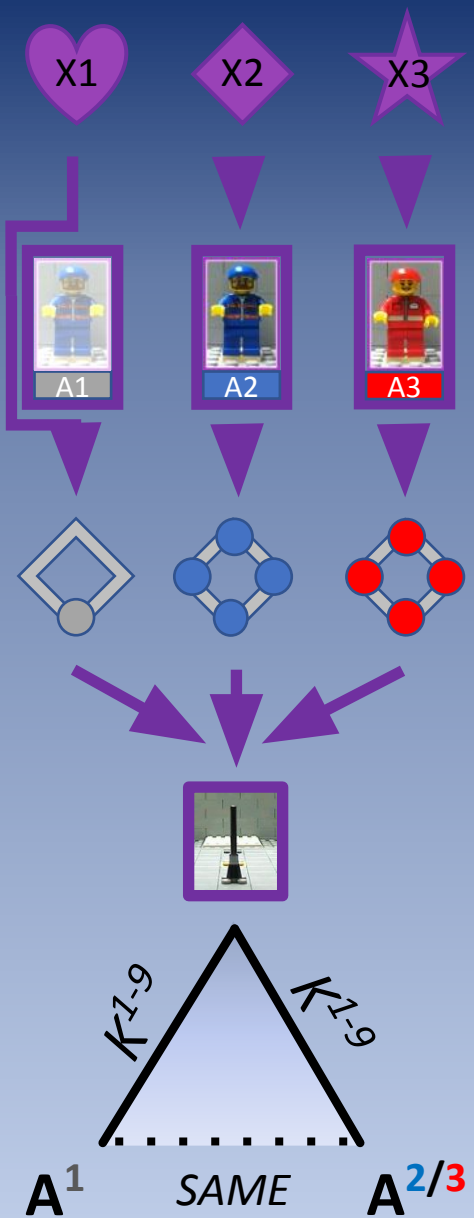
FRONT BACK LEFT RIGHT

Continue to give the best answers.

Diagram illustrating a process flow on the right side:

- Three input images labeled A^1 , A^2 , and A^3 are shown in a row.
- Each image is associated with a symbol above it: a heart for X^1 , a diamond for X^2 , and a star for X^3 .
- Below each image is a corresponding geometric pattern: a diamond with a grey circle for A^1 , a blue diamond with four blue circles for A^2 , and a red diamond with four red circles for A^3 .
- Arrows from these patterns point to a central image of a minifigure in a room.
- Below this central image is a triangular logic block with a dashed left side labeled $???$, a solid right side labeled K^{VBNM} , and a dashed bottom side labeled $SAME$. The vertices are labeled A^1 , $A^{2/3}$, and $A^{2/3}$.





Feedback Off!

Level: 22

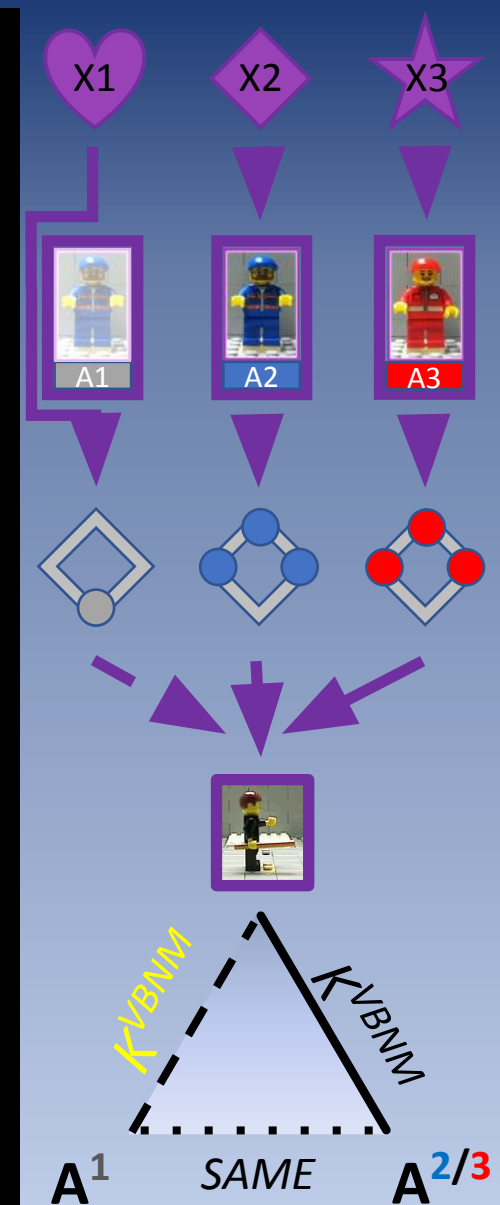
V, B, N, M

FRONT BACK LEFT RIGHT

Continue to give the best answers.

Diagram illustrating a process flow on the right side:

- Inputs: Three images labeled A^1 , A^2 , and A^3 (featuring a blue minifigure, a blue minifigure, and a red minifigure).
- Intermediate representations: Three graph-like structures corresponding to A^1 , A^2 , and A^3 .
- Output: A central image showing a minifigure in a room.
- Triangle diagram below: A triangle with vertices labeled A^1 , $A^{2/3}$, and $SAME$. The left and right sides are labeled K^{VBNM} . The bottom side is a dashed line.



Results

	P1	P2	P3	P4	P5
Minutes to Complete	33.82	(29.16)	33.94	18.04	16.60

Results

	P1	P2	P3	P4	P5
Minutes to Complete	33.82	(29.16)	33.94	18.04	16.60
Training Correct/Incorrect Trials	306/35	N/A	281/23	255/10	255/15

Results

	P1	P2	P3	P4	P5
Minutes to Complete	33.82	(29.16)	33.94	18.04	16.60
Training Correct/Incorrect Trials	306/35	N/A	281/23	255/10	255/15
Testing Correct/Incorrect Trials	8/0**	N/A	7/1*	7/1*	8/0**

** $p < .0001$

* $p < .001$

Results

	P1	P2	P3	P4	P5
Minutes to Complete	33.82	(29.16)	33.94	18.04	16.60
Training Correct/Incorrect Trials	306/35	N/A	281/23	255/10	255/15
Testing Correct/Incorrect Trials	8/0**	N/A	7/1*	7/1*	8/0**

** $p < .0001$

* $p < .001$





CEU's ?

Sign In

Sign Out

Hokie Pokie

Contact:

Dr. Paul Guinther

drpaulguinther@gmail.com

Future Directions

- Demonstrate derived modeling of material perspective.
 - *Across coordinated vs. opposite* interpersonal alignments
 - “Modeling” vs. “Reverse Modeling”
- Expand procedures to induce derived modeling in developing children.
- Use relational triangulation framework to enhance client modeling of therapist behavior.

Social Modeling

(Bandura, 1977)

- **Copying the behavior of those with whom you *identify*.**
- **Observational Learning**
 - The behavior of another has been observed, but its copied emission hasn't been directly reinforced for the self.
- **Vicarious Reinforcement**
 - Whether the behavior is copied depends on consequences delivered to the model for the model's behavior.

Derived Modeling

(Guinther, 2017; Now)



- **Transposing another's perspective on to the self based on *alignment*.**
- **Derivation**
 - The behavior of another is a relatum, but its transposed emission hasn't been directly reinforced for the self.
- **Virtual Reinforcement**
 - How the behavior is transposed depends on the historical context-dependent pattern of consequences delivered to the self while perspective taking.

Welcome to the Experiment!

For each of the following trial-and-error problems, you will be shown a shape and a scene, and then you will make a response by pressing a key on the keyboard. You will be shown a happy face if you make a correct selection or you will be shown a sad face if you make an incorrect selection. Use the feedback to learn how to get the problems right on a consistent basis.

You will need to pay attention to the shape *and* the scene *and* the feedback to figure out how to solve the problems.

Level: 1
A, S, D

- 1) Note which shape appears, and wait for it to fill...
- 2) Pay attention to the scene, which will also change across trials.
- 3) Press A, S, or D (New keys will become available at higher levels)
To pick the figure on the left, press A
To pick the figure in the middle, press S
To pick the figure on the right, press D
- 4) Learn from the feedback:  correct  wrong
- 5) Fill the scoreboard with points to reach the next level.
- 6) Press the space bar to load the next trial.

Please ask the experimenter if you have any questions; press the space bar to begin.