

## Appendix 1. Master facilitator text

### MENTAL MODEL MAPPING ACTIVITY

#### Part 1: Pre-intervention/control (same for *EcoChains* game & control groups)

##### Facilitator Guide

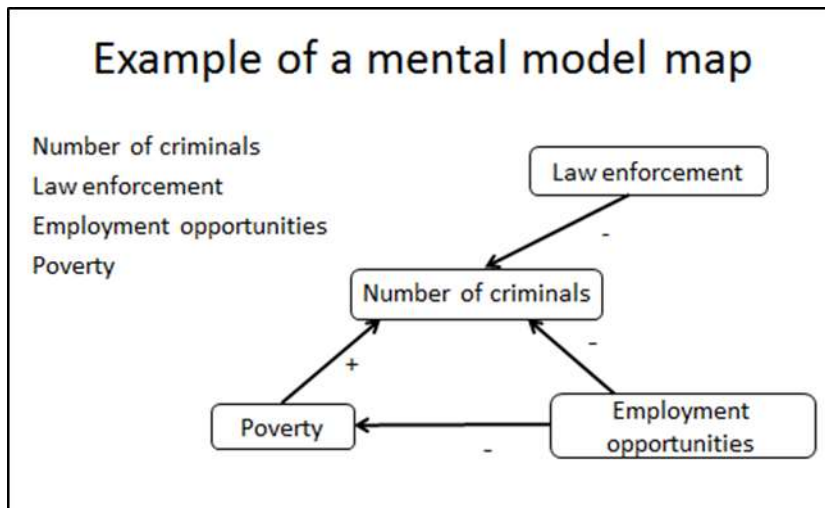
Participants are given a mapping sheet, a grey, lead pencil and an eraser. Sharpeners on the tables. (Maps produced individually not as group)

##### INSTRUCTIONS (5 MINUTES):

1. Thank you for completing the preliminary questionnaire. Now we have another exercise to complete before the game.
2. The purpose of this exercise is to draw maps that illustrate your ‘mental models’ or in other words, your *thinking* about the health of Arctic ecosystems.
3. Don’t worry if you feel you don’t know enough about the Arctic to produce such a map. This is not about being ‘right’ or ‘wrong’. We are interested in what you know and think.

Also: don’t worry if you don’t know how to draw maps showing this kind of information. I’ll be guiding you through this process step-by-step so that you can produce your own map. Before we begin, here is an example of the kind of map you will be producing.

SHOW EXAMPLE OF MENTAL MODEL MAP (see figure below)



4. This is an example of a map representing a person's thinking about crime in their neighborhood. Note that this is a *hypothetical example* that we are using to exemplify how one person might represent their thinking about a particular issue.

As you can see, this hypothetical person considered that the key issues relating to crime in their neighborhood were: *[read out list on top left]*. The diagram on the right shows how this individual perceived the relationships between these different factors.

#### GO THROUGH MAP AND EXPLAIN STEP-BY-STEP

Any questions? (*Clarify all questions – make note of all questions asked*)

Let us begin.

#### MAPPING (15-20 MINUTES):

*(Selection of key concepts by participants)*

#### ASK THEM TO USE LEAD PENCIL ONLY

1. When I mention the Arctic marine and sea-ice ecosystems, including the species and inhabitants of these ecosystems, what does it make you think of? What aspects, issues or concepts come to mind?
2. Please list down the left hand side of the paper provided all the different concepts or aspects that come to mind when you think of the Arctic marine and sea-ice ecosystem. Your concepts can be simple words or nouns (such as “fish” in the example I showed you), or more complex concepts, such as “trout populations in the summer”.

*Wait for participants to write list of concepts, until they start slowing down.*

3. Now I want you to think about all the factors that affect negatively affect the health of Arctic marine and sea-ice ecosystems positively, its species and inhabitants.

List all these factors on the left side of your paper straight underneath the previous list.

If you find you have already listed factors that negatively affect the health of the Arctic, that is fine. There is no right or wrong in what you think is important.

*Wait for participants to write list of concepts, until they start slowing down.*

4. Now I want you to think about all the factors that affect positively affect the health of Arctic marine and sea-ice ecosystems positively, its species and inhabitants.

List all these factors on the left side of your paper straight underneath the previous list.

*Wait for participants to write list of concepts, until they start slowing down.*

*(Mapping begins).*

5. Great. Now the mapping begins.

- 1) Firstly, please select one concept from your list that you feel is the most important in relation to the health of the Arctic, and write it down somewhere in the middle of your sheet of paper.

*Wait for participants to write central concept*

- 2) Now select a concept from your list that you feel strongly influences *or is influenced* by this central concept and write it on the paper near to the central concept.

*Wait for participants to write next concept*

- 3) Draw an arrow connecting the two concepts. The direction of the arrow will indicate the direction of the relationship.

*Wait for participants to draw arrow*

- 4) Now indicate next to the arrow whether you think this relationship is +ve or -ve. Simple write “+” or “-“ alongside the arrow.

*Wait for participants to add sign*

- 5) Now select another concept from your list that influences *or is influenced* by any of the concepts on your map.

*Wait for participants to complete this*

- 6) Write it on the paper.
- 7) Link the concepts with arrows. Indicate a plus or minus sign next to the arrow.
- 8) And so on.

**\*\*You are not restricted to the list of concepts you generated at the beginning. If you realize something is missing, please add it in as you draw your map.**

**\*\*You may alter your map as you go, change arrow directions and so forth, until you are happy with the final map. Please take your time.**

If you have any questions, please ask!

*Wait for participants to complete their maps*

*(Weighting the influences)*

- 9) Once you have a map that you are content with, I will ask you to indicate the strength of the relationship between concepts. You will do this by writing a number from 1 to

3 alongside the arrows, where 1 indicates a weak relationship, 2 indicates a medium strength relationship and 3 indicates a strong relationship.

\*\* You may alter your map as you go, change arrow directions and strengths of relationships and so forth, until you are happy with the final map. Please take your time.

*(Final remarks as people are finishing up)*

6. When you are happy with your final map, and you feel it represents your thinking about the health of the Arctic marine and sea-ice ecosystems, please put your pencils down so I can collect your map. If you need to clarify anything about your map, please do so then. Thanks!

When everyone else has finished:

WE CAN MOVE ON TO THE NEXT PART.

## **Part 2: POST-intervention/control (slight difference between game & control groups)**

### Facilitator Guide

*Participants' previously drawn cognitive maps are returned to them; also given a colored pencil (no erasers!) NB: colored pencil used to distinguish from plain lead pencil used for Part I.*

*READ OUT ALL NON-ITALICIZED TEXT:*

5. As you can see, I have returned your original maps to you. Remember that these maps illustrate your thinking about the health of Arctic marine and sea-ice ecosystems.
6. Now I am going to ask you to examine your maps, and based on what you might have learned from [playing Eco-chains/the article you just read], adjust them accordingly. For example:
7. If you wish to delete anything, *please put a neat line through it. Don't rub it out!* We are interested in what you thought before you played the game.
8. Please adjust your map as you see fit, until you are happy with the final map. Please take your time.

If you have any questions, please ask! *(Adjusting maps (10 minutes))*

*Wait for participants to work on their maps, until they start slowing down.*

*(Final remarks as people are finishing up)*

9. When you are happy with your final map, and you feel it represents your thinking about the health of the Arctic marine and sea-ice ecosystems, please put your pencils down. If you need to clarify anything about your map, please do so then. Thanks!