

A GUIDE TO ATKISSON ACCELERATOR AND SYSTEMS THINKING TOOLS & METHODS



COMPASS EDUCATION

Compass Education

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About Compass Education

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Compass Education (CE) is a non-profit organisation and network of teachers, school administrators, students and non-formal educators that is registered in the US and based in Thailand. CE strives to empower and connect learning communities to educate and act for a sustainable future. We do this through advocating and applying systems thinking and experiential learning pedagogy with the social/organisational and technical/economic aspects of school practice.

The issues and challenges of sustainability cannot be reduced to mere pieces or problems that can be tackled as if they were unconnected to the rest of the world. Sustainability challenges are interconnected and the linkages are often invisible to our eyes and minds. Our young people need new skills and values to make informed decisions, and thus we need to find simple models and approaches to help us understand and address this complexity in more intuitive ways that both children and adults can easily grasp and relate to. It is for this reason that we utilize the Sustainability Compass ("Compass" for short) as an effective tool, framework, thinking lens, and 'habit of mind' in educating for a sustainable future. The Compass has, as you might guess, played a pivotal role in the organizational philosophy and approach of Compass Education, even giving us our name. We use the Sustainability Compass as our foundational framework and thinking model for inculcating a systems thinking 'habit of mind' in educating for a sustainable future.

CE provides certified training for students, teachers and administrators on using the Compass and systems thinking for integrative, big picture issue analysis, innovative problem solving and sustainable action. Systems thinking is the core skill necessary for students to successfully function within our increasingly complex world, and systems thinking is at the core of Compass Education's tools. Our Educator Empowerment training is intended for teachers, sustainability or environmental coordinators, service learning coordinators, curriculum coordinators and those in similar roles. Our Student Empowerment training programme is designed for middle and high school students to be able to effectively use and train others, including their peers and their teachers, on Compass, sustainability and systems thinking.

In 2015, in celebration of the Sustainable Development Goals (SDGs), AtKisson Group made its **Accelerator** tools available in a simplified format that anyone can use. **Accelerator Lite** gives educators the essentials, so that you can get started working with your classroom, your colleagues, or any other group, in an education or non-commercial context. For more information on the Accelerator tools visit our website at: <http://www.compasseducation.org/resources/compass-and-accelerator/>.

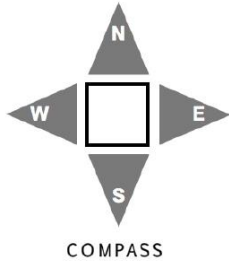
About this Compendium Guide

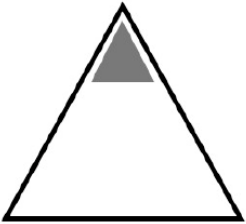
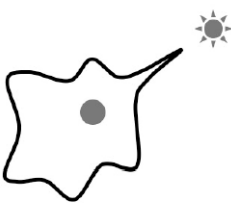
This guide provides a summary of tools that Compass Education's promotes and trains educators and students to use in learning to participate in building a sustainable future. The Compass Education approach adapts and utilizes the AtKisson Sustainability Compass and Accelerator tools, together with a number of different Systems Thinking tools and methods, to allow sustainability learning to happen without necessarily having to explicitly focus on this sometimes controversial and often times abstract term and concept.

ATKISSON ACCELERATOR LITE TOOLKIT

Accelerator Lite is a set of generally applicable concepts, tools, processes, and methods for teaching and learning sustainability, for assessing sustainability, for creating sustainable development plans, for young people and adults to work together across disciplines and cultures, for speeding up innovation processes, and several other things besides. All of the tools of *Accelerator Lite* have grown out of the AtKisson Group's extensive experience working with companies, governments, schools, cities, and many other types of organizations. They have been used successfully in dozens of different countries and cultures, all around the world.

The tools of Accelerator Lite are protected by international copyright. Use of the Accelerator is subject to licensing, which is easy to obtain for anyone. Unauthorized copying or use of the Accelerator, or any piece of the Accelerator, is prohibited. The AtKisson Accelerator Lite License can be obtained from this link: <http://atkisson.com/acceleratorlite/>.

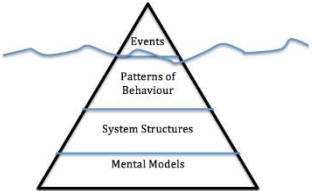
	TOOL	DESCRIPTION
1	Sustainability Compass 	<p>The Sustainability Compass, or Compass for short, is a tool that brings people together around a common understanding of sustainability, and a shared vision for getting there. The Compass is easy to understand. A regular compass helps us map the territory and find our direction. The Sustainability Compass does the same thing for sustainability. It takes the English-language directions — North, East, South, West — and renames them, while keeping the same well-known first letters:</p> <p>N is for Nature – All of our natural ecological systems and environmental concerns, from ecosystem health and nature conservation, to resource use and waste.</p> <p>E is for Economy – The human systems that convert nature's resources into food, shelter, technologies, industries, services, money and jobs.</p> <p>S is for Society – The institutions, organizations, cultures, norms, and social conditions that make up our collective life as human beings.</p> <p>W is for Wellbeing – Our individual health, happiness, and quality of life.</p> <p>Educators can use the Compass to build in a sustainability lens to any topic, issue, lesson, activity or project that they use with their students. Students can use the Compass for note taking, forming questions, analysis and synthesis, and assessment. The Compass is a highly versatile but simple tool that provides a common language to teachers and students to always be thinking about sustainability, what we call having a “sustainability habit of mind”.</p> <p>References: http://www.compasseducation.org/about/</p>

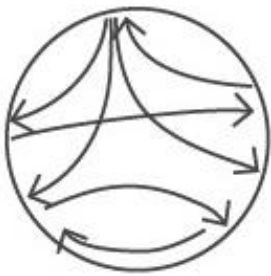
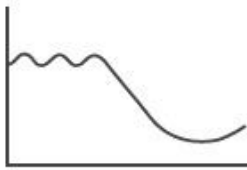
<p>2</p>	<p>Pyramid Lite</p>  <p>PYRAMID</p>	<p>The "Pyramid" is the named for the three-dimensional model that is built during the course of a sustainability training, learning or planning process by any group of people (e.g. students, teachers, community, etc.). It can be perfectly meshed with the Sustainability Compass. The Pyramid model is used to capture and reflect the results of the group process, and to symbolize the group's conclusions and resulting commitments to future action.</p> <p>"Pyramid Lite" is the step-wise process tool (using the Pyramid structure) that can be used in a number of effective ways for either the classroom or as a process and structure for project based learning. It is a fantastic tool for using in an interactive role-play introduction to sustainable development. It is also useful for creating new initiatives, projects, visions, or strategies, as it facilitates a multi-stakeholder process for building consensus around a course of action. When necessary, it can do all three of things at the same time.</p> <p>References: http://www.balticuniv.uu.se/index.php/component/docman/doc_download/768-pyramid-lite</p>
<p>3</p>	<p>AMOEBEA</p>  <p>AMOEBEA</p>	<p>The "Amoeba" is named for its central metaphor: thinking of cultural groups as "amoebae", first sending out exploratory "pseudopods" towards new ideas, and then shifting the whole amoeba to a new position. The tool is based on classic innovation diffusion theory, augmented by over 20 years of consulting experience in sustainable development. Playing Amoeba role-lay game helps students build competence in the art of change agency. It includes a set of analysis tools and models, with a roll-playing simulation game, and worksheets designed to support strategic thinking, planning, and decision making around how to introduce and spread innovative ideas in a culture or organization. Perfect tool for student community service learning teams.</p> <p>References: https://amoebau.wordpress.com/author/alanatkisson/ http://share.nanjing-school.com/ict/files/2015/03/Amoeba-Breakout-Saturday-Session-17gnlro.pdf</p> <p>AtKisson, Alan, The Innovation Diffusion Game: in Making It Happen (IC#28), Spring 1991, Page 58</p>

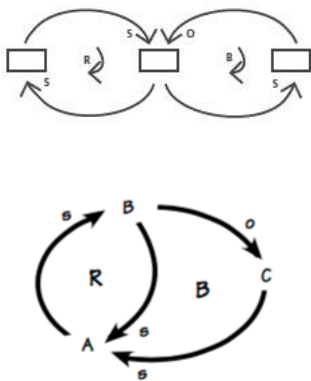
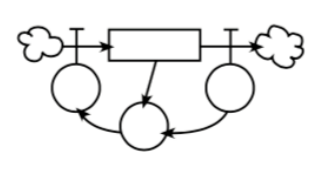
SYSTEMS THINKING TOOLS

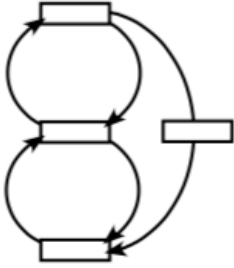
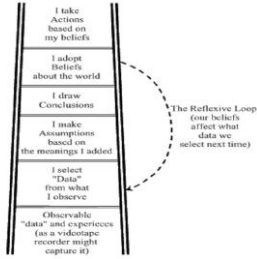
Systems thinking [is] a way of thinking about, and a language for describing and understanding, the forces and interrelationships that shape the behavior of systems. This discipline helps us to see how to change systems more effectively, and to act more in tune with the natural processes of the natural and economic world. Systems thinking in education helps develop students who can understand the value of other opinions, and see things from a different perspective or lens. Systems thinking isn't just about the tools to help students see the world with a better lens; it also can give them a greater grasp of why things happen a certain way. Things are circular in systems thinking, and recognizing the complex nature of cause-and-effect relationships can help students understand why things happen. Using systems thinking approaches in the classroom creates students who can see from another perspective and look deeper to why world events play out in certain ways. If students develop those habits of thinking systemically, and they look at any global issue, they are going to ask different questions.

There are a number of tools that are used to help students use systems thinking and develop the habits of a systems thinker. The following describes the various systems thinking tools (which are not proprietary by the way) that Compass Education uses and promotes in our trainings, programmes, projects and activities.

	TOOL	DESCRIPTION
1	<p>Systems Iceberg</p> 	<p>The iceberg model is a systems thinking tool designed to help an individual or group discover the patterns of behavior, supporting structures, and mental models that underlie a particular event. One of the primary reasons we train teachers and students to use the iceberg is that it is a fantastic tool for guiding us to ask the right questions to any issue, problem and situation that we are addressing. The iceberg structure guides us in our analysis of events and where and how to make change – or more directly, to identify and act on the system's “leverage points.”</p> <p>References:</p> <p>http://www.watersfoundation.org/webed/library/articles/STarticle-07.pdf</p> <p>http://donellameadows.org/wp-content/userfiles/iceberg-model.pdf</p>

<p>2</p>	<p>Connection Circle</p> 	<p>A Connection Circle is a simple visual tool that shows the relationships among variables in a story. It is simply a large circle drawn with all of the identified variables labeled randomly around the circumference of the circle. From this, connections between the different variables in a story can be found and explained. The final product produces a spider web of connections, and allows students to identify 'hubs' or high impact leverage points for systems disruption and change.</p> <p>A connection circle supports students in generating ideas and connections, and to clarify their thinking about the underlying causes of complex issues by allowing them to visually trace webs of causal relationships within systems to understand those changes.</p> <p>References: http://www.tucsoncactus.org/pdf_files/STEM/Connection%20Circles.pdf https://www.youtube.com/watch?v=Hy5RYfz9Xdg https://www.youtube.com/watch?v=hUb7SmgDE1Q</p>
<p>3</p>	<p>Behaviour Over Time Graphs</p> 	<p>A Behaviour-Over-Time graph (BOTG) is a curved line showing the trend or pattern of change of a variable over time. A BOT graph is a simple tool that can help students focus on patterns of change over time, rather than on isolated events, leading to rich discussions on how and why something is changing. This tool can be used to graph the behaviour of different variables or issues over time in order to gain insights into any interrelationships between them. They can include past, current and future behaviour in a story. BOT graphing is used in combination with other systems thinking tools such as the iceberg and causal loop diagramming.</p> <p>Reference: http://www.watersfoundation.org/webed/mod3/downloads/Tips-BOTGS.pdf http://watersfoundation.org/resources/rubric-for-botg/ http://static.clexchange.org/ftp/documents/x-curricular/CC2001-11EverydayBOTGs.pdf http://static.clexchange.org/ftp/documents/math/MA2000-10GraphingSkills.pdf https://thesystemsthinker.com/behavior-over-time-diagrams-seeing-dynamic-interrelationships/ https://www.youtube.com/watch?v=1lo5XOe2iZ8</p>

<p>4</p>	<p>Causal System Diagram (Map)</p> 	<p>Causal loop diagrams (CLDs) are ways to visualize relationships of important variables in a system where a change in one variable causes either a decrease or increase in another. By looking at the all the interactions of the variables, the behavior of the entire system is discovered. These diagrams consist of arrows connecting variables (things that change over time) in a way that shows how one variable affects another. A causal loop diagram drawing can show the relationships among one or more feedback loops relevant to a story being analyzed. The influence of the feedback will always create either a reinforcing or balancing dynamic in the system.</p> <p>The arrows show the direction of causality. The signs (+, -, or S, O) on the arrows have a special meaning, different from the usual one. A plus or Same symbol (+ or S) means that a change in one variable has an effect <i>in the same direction</i> on the other. A minus or Opposite symbol (- or O) means that a change in one causes a change <i>in the opposite direction</i> in the other.</p> <p>Learning to build the causal loop diagrams can help students identify and understand the interdependencies in the whole systems that they are interested in managing or changing through some intervention (such as a new idea for community sustainability improvement). Sometimes they reveal things we want to avoid.</p> <p>Reference:</p> <p>http://www.watersfoundation.org/webed/mod5/mod5-4.html</p> <p>https://www.youtube.com/watch?v=tTo06jbsZ4M</p> <p>https://en.wikipedia.org/wiki/Causal_loop_diagram</p> <p>http://www.public.asu.edu/~kirkwood/sysdyn/SDIntro/ch-1.pdf</p>
<p>5</p>	<p>Stock and Flow Diagram</p> 	<p>A Stock and Flow Diagram is essentially a drawing that illustrates the causal dynamics that are taking place around a stock of something (like a forest or a water reservoir) and its inflows and outflows, defined in terms of units of the stock per unit of time ("stuff" in the stock per time). A stock / flow diagram helps us see what influences the increase or decrease of a stock. For example, a population of orangutan in a national park is a stock determined by new births (inflow) and deaths (outflow).</p> <p>References:</p> <p>http://www.watersfoundation.org/webed/mod4/downloads/Tips_Stock_flows.pdf</p> <p>http://www.watersfoundation.org/webed/mod4/mod4-4.html</p> <p>https://www.youtube.com/watch?v=UL8azVk479M</p>

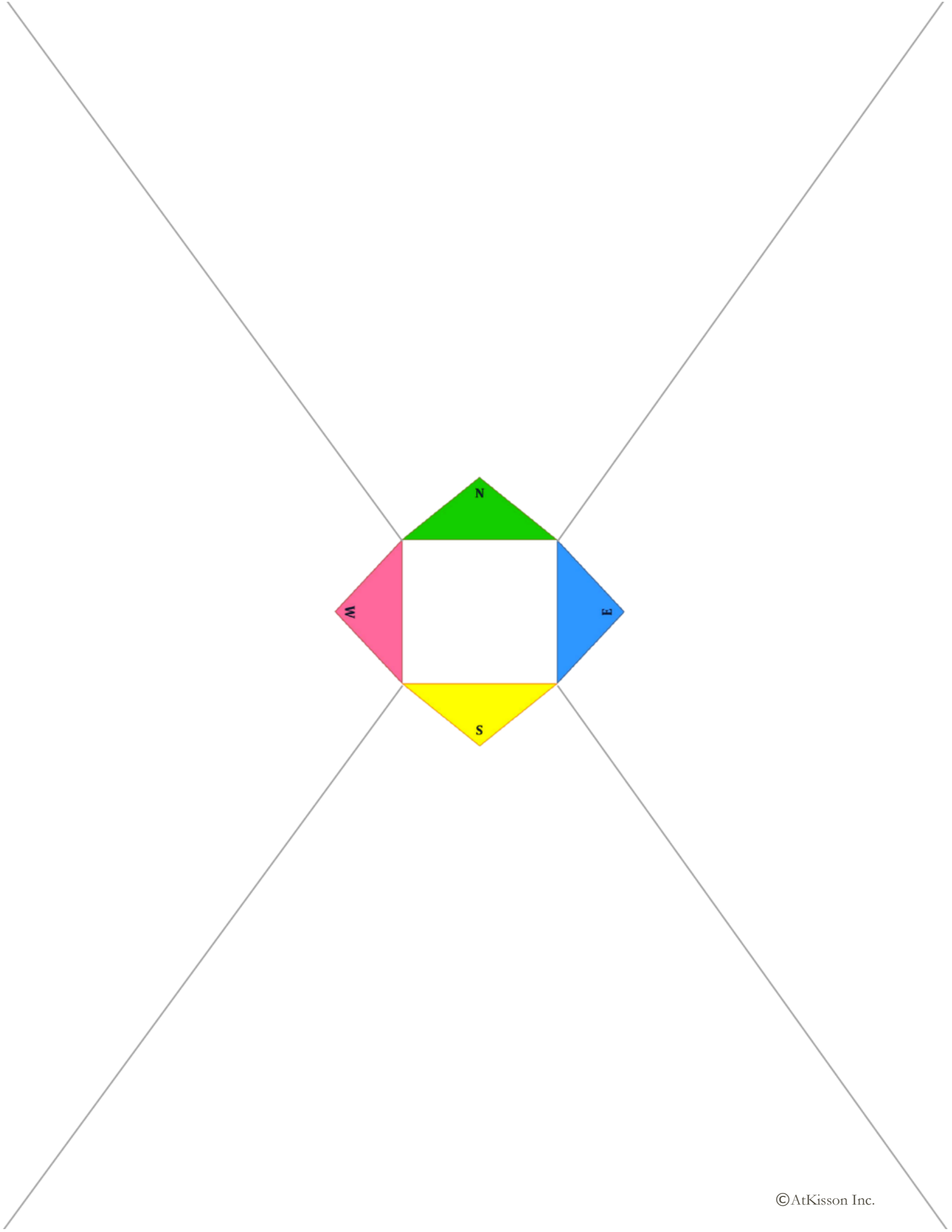
<p>6</p>	<p>System Archetypes</p> 	<p>System Archetypes are highly effective tools for gaining insight into patterns of behavior, as they are themselves reflective of the underlying structure of the system being studied. The archetypes can be applied in two ways: 1) diagnostically, by recognizing patterns of behavior that are already present in the system, and 2) prospectively, by serving as the means for gaining insight into the underlying systems structures from which the archetypal behavior emerges. There are essentially 8 basic archetypes recognized. The set of common systems archetypes have their own unique causal storyline. This storyline is universal and can be applied to the understanding of individual manifestations inside a particular group or organisation. Aside from a storyline, systems archetypes have a structure. The structure of systems archetypes is depicted through causal loop diagrams.</p> <p>Archetypes can be effective tools for older students in answering the question, “Why do we keep seeing the same problems recur over time? The theory behind systems archetypes is that situations with unwanted results or side effects can be mapped to the common behavior models. Given the knowledge available about systems archetypes, problem-solvers in general can apply its principles and arrive at a rich diagnosis of a situation and plan a recovery. The knowledge base on systems archetypes provides guidelines for determining what archetype is at play and, once identified, how to approach an intervention.</p> <p>Reference: https://www.saybrook.edu/rethinkingcomplexity/rc-posts/systems-archetypes-and-their-application/ https://en.wikipedia.org/wiki/System_archetype</p>
<p>7</p>	<p>Ladder of Inference</p> 	<p>The <i>Ladder of Inference</i> describes the thinking process that we go through, usually without realizing it, to get from a fact to a decision and action. The thinking stages can be seen as rungs on a ladder. Starting at the bottom of the ladder, we have reality and facts. From there, we:</p> <ul style="list-style-type: none"> • Experience these selectively based on our beliefs and prior experience. • Interpret what they mean. • Apply our existing assumptions, sometimes without considering them. • Draw conclusions based on the interpreted facts and our assumptions. • Develop beliefs based on these conclusions. • Take actions that seem "right" because they are based on what we believe.

		<p>This pattern of thinking can create a vicious circle. Our beliefs have a big effect on how we select from reality, and can lead us to ignore the true facts altogether. Soon we are literally jumping to conclusions – by missing facts and skipping steps in the reasoning process.</p> <p>By using the Ladder of Inference, people (teachers and students) can learn to get back to the facts and use their beliefs and experiences to positive effect, rather than allowing them to narrow their field of judgment. Following this step-by-step reasoning can lead to better results, based on reality, and avoiding unnecessary mistakes and conflict.</p> <p>References:</p> <p>http://schoolsthatlearn.com/wp-content/uploads/2012/06/ladder-of-inference.pdf</p> <p>http://www.cfn107.org/uploads/6/1/9/2/6192492/ladder_of_inference_diagrams- use_pages_4_and_8_only.pdf</p> <p>http://watersfoundation.org/resources/ladder-of-inference-1a/</p>
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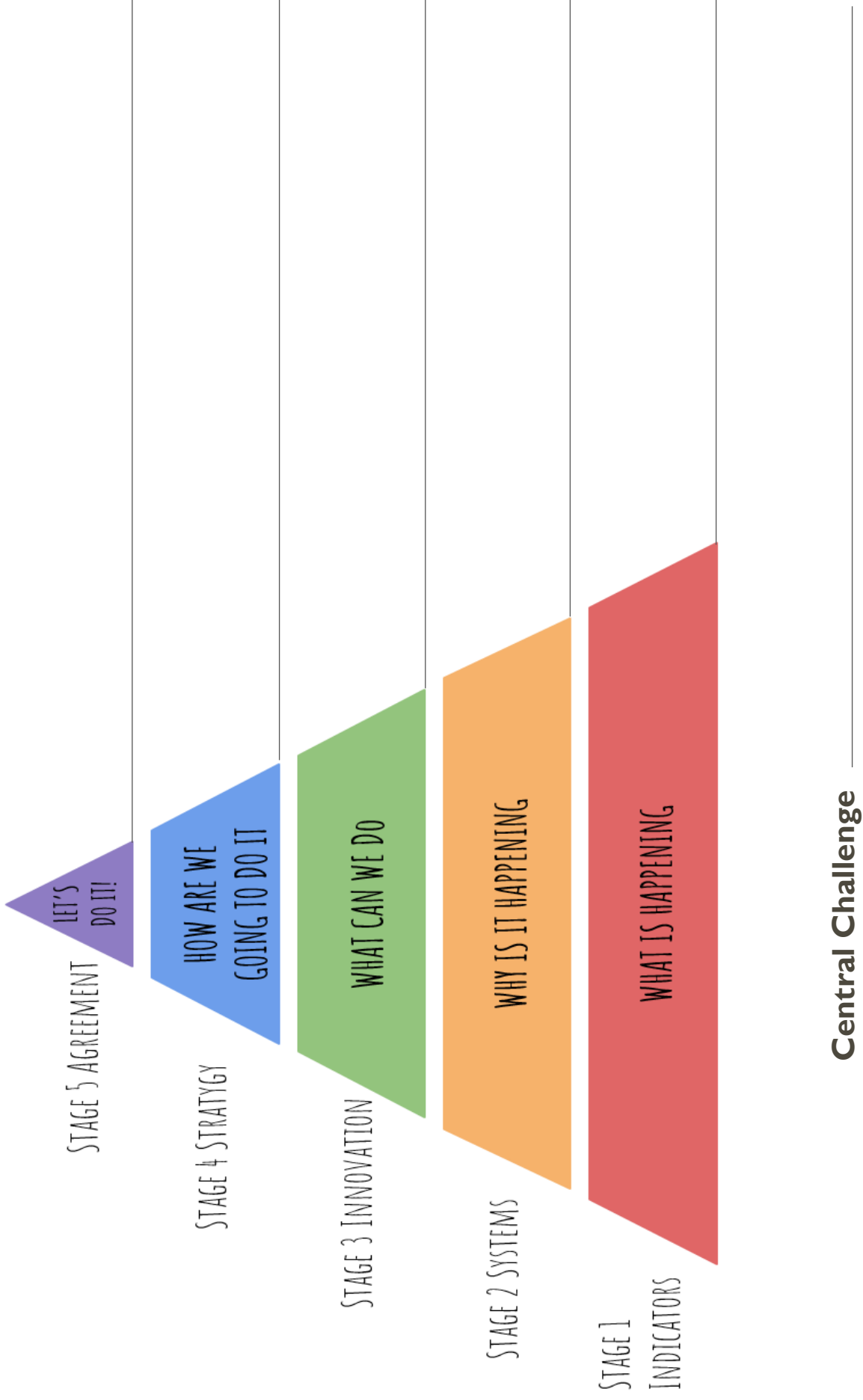
Note: Template of the tools can be found on the next pages

- 1. The Compass of Sustainability Page 10
- 2. Pyramid Lite Page 11
- 3. The Systems Iceberg Page 12
- 4. Ladder of Inference Page 13

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PYRAMID LITE PROCESS



The Systems Iceberg

Events

What happened?

Patterns of Behavior

What's been happening over time?
What are the trends link to the event?

Systemic Structures

What system structure has generated these pattern of behaviours?

Mental Models

What assumptions, beliefs, values and worldviews that develop these system structures?

Ladder of Inference

