

## Support Resources 1 – includes items to view pre-workshop

These resources (a mix of primarily videos and some activities) support:

- your own PD
- student learning outcomes

for each of **Statistics, Sustainability, Systems thinking, STEM** and **Industry 5.0 and Future of Work**.

They are chosen to help:

- develop an understanding of the aspect; *and/or*
- inform students and educators about how the aspect is used

**It is expected you will have viewed videos with an asterisk (\*) in final column of table (*totalling to approx. 1 hour*) BEFORE attending Workshop 1 and those with **\*\*** (*totalling to approx. ¼ hour*) before Workshop 2**

**NOTE:**

- **Educators of all Grades will derive value from all provided links:**
  - professional and personal practice/development
  - informing classroom/student engagements and activities
- **The penultimate column of the table, ‘Audience’, identifies the likely appropriate *student* audience.**

| Aspect            | Resource type  | Link (Duration)  | Purpose   | Overview   | Audience:<br><b>All educators</b><br>+ students of<br>Grades noted | Watch<br>before<br>workshop |
|-------------------|--|--|---|--|--|-----------------------------|
| <b>Statistics</b> | <b>Video</b>   | <a href="#">13 (3- to 5-minute) videos of industry professionals</a>   | Provides authentic advice from industry experts about <u>how statistics is used in practice and careers in statistics</u> | Professionals from varied organisations & backgrounds, including: QANTAS, NASA, NSW Health, Coal Chain Coordinator, Astrobiologist, Radiation Oncologist, Statistician, Sports Scientist, Epidemiologist   | <b>Grade 4 and above</b>   | <b>* (at least one)</b>     |
|                   | <b>Animated videos, interactive exercises and additional links</b> | <a href="#">Ten (5-minute) animated videos, and supporting interactive exercises and extension links</a> – collectively referred to as <b>StatsTuneUp!</b> | Develops conceptual understanding of key statistical ideas and methods  | <ul style="list-style-type: none"> <li>• Practical examples from multiple fields to motivate &amp; hone interest.</li> <li>• Develops conceptual understanding.</li> <li>• Limits jargon, and applies statistical labels after a technique, process or concept has been described.</li> <li>• Simplifies structure and details presented on-screen at any time.</li> <li>• Ensures visual cues and animations support the spoken words.</li> </ul> | <b>Grade 5 and above</b>   | <b>* (at least one)</b>     |
|                   | <b>Video</b>   | <a href="#">Perception v Reality: The need for data (13 mins – view at least first 7 minutes)</a>  | Identifies how perceptions aren't necessarily correct   | Speaks to the importance of data for informing, and correcting, perspectives   | <b>Grade 5 and above</b>   | <b>* (first 7 minutes)</b>  |
|                   | <b>Video</b>   | <a href="#">Animated overview of Statistics (5mins)</a>  | What is statistics  | Animated – includes explanation of descriptive and inferential statistics, types of variables, sample and population   | <b>Grades 3 - 10</b>   |                             |
|                   | <b>Video</b>   | <a href="#">Insight into how, where and why Statistics is valuable &amp; interesting (3 mins)</a>  | Succinct inspirational insight – statistics is ubiquitous   | Many female and male professionals speaking about their revelations about Statistics (music, economics, health, marketing, agriculture, social justice, nutrition, United Nations) – and examples of its practical value   | <b>Grade 5 and above</b>   |                             |
|                   | <b>Video</b>   | <a href="#">Insight into how, where and why Statistics is valuable &amp; interesting (3 mins)</a>  | Succinct inspirational insight – statistics is ubiquitous   | Many female and male professionals (including Journalist, Economist, Defense, Social Policy) speaking about their revelations about Statistics – and examples of its practical value   | <b>Grade 5 and above</b>   |                             |
|                   | <b>Video</b>   | <a href="#">Statistics is about improvement – Health context (11 mins)</a>   | Exemplifies statistics & quality improvement  | Contextualises statistics and <b>quality improvement</b> - Healthcare; Scientific, Systems and Process thinking; Psychology and Behavioural aspects<br><b>(perhaps view first 50 seconds and then jump to 3min 57s)</b><br><b>Should be mandatory for all entering workforce!</b>  | <b>Grade 5 and above</b>   |                             |
|                   | <b>Video</b>   | <a href="#">Intro overview about statistics (2 mins)</a>   | Pointing out how data is used to inform decisions   | Many examples connecting with how we use in daily life and some terminologies about data collection and statistical analysis<br><b>(odd ending)</b>  | <b>Grade 5 and above</b>   |                             |

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|-----------------------|--|--|--|---|--|-----------------------------|
|                       | <b>Video</b>                                 | <a href="#">Predictive Analytics – transforming data into future insights (3 mins)</a>               | Describing predictive analytics  | Animated - Inspire interest through many succinct examples  | <b>Grade 5 and above</b>   |                             |
|                       | <b>Video</b>                                 | <a href="#">Where statistics is used – Business context: analytics (11 mins)</a>                     | Describing the aspects of analytics  | <b>Informing thoughts about future directions/careers</b><br>Perhaps more useful for those teaching the following (cross-disciplinary value): Economics/Business/Finance, Mathematics in practice, and/or Career advice (specifically from 9min 20s)<br><b>^^provides insight for educators of younger ages including first steps when undertaking investigations</b>   | <b>Grade 10 and above ^^</b>                                       |                             |
|                       | <b>Video</b>                                 | <a href="#">Investigations – asking the right questions (9 mins)</a>                                 | Focusses on the importance of contextualising  | Cross-disciplinary value – Economics/Business   | <b>Grades 11-12</b>  |                             |
|                       | <b>Video</b>                                 | <a href="#">Investigations – asking the right questions (3 mins)</a>                                 | Reflection on data analysis experience   | Female professional data analyst – practical value and personal insight   | <b>Grades 11-12</b>  |                             |
|                       | <b>Activity:<br/>Student<br/>Competition</b> | <a href="#">National Schools Poster Competition (NSPC)</a>   | Students conduct small-scale versions of real-world investigations in teams, developing core STEM, statistics and cross-functional skills. | Students create and submit (via their teacher) an informative e-poster presentation communicating their investigation clearly, concisely and creatively.<br><b>Support:</b><br><ul style="list-style-type: none"> <li>• <a href="#">1-minute overview video</a></li> <li>• <a href="#">4-minute rationale video</a></li> <li>• <a href="#">6-minute how to deliver video</a></li> <li>• <a href="#">6-minute testimonials video</a></li> </ul> <ul style="list-style-type: none"> <li>• <a href="#">Resources and Details</a></li> <li>• <a href="#">Past winners and feedback</a></li> </ul> | <b>Grades 3 - 12</b>   | *                           |
| <b>Sustainability</b> | <b>Video</b>                                 | <a href="#">Considering systems thinking with reference to sustainability and education (4 mins)</a> | Systems thinking is everywhere and innate  | Reflection on systems and outcomes and problem solvers, and how children are natural system thinkers  | <b>Grade 3 and above</b>   | *                           |
|                       | <b>Video</b>                                 | <a href="#">What is sustainability? (3 mins)</a>   | Consumption and Connectedness  | Brings a focus on the replacement rate and connects with systems thinking and the 3Es (Environment, Economy, Equity) to support a balanced consideration  | <b>Grades 3 - 6</b>  | **                          |

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|-------------------------|--|--|--|--|--|-----------------------------|
|                         | <b>Video</b>                                 | <a href="#">What is sustainability beyond the environment? (4.5 mins)</a>          | Thinking holistically and problem-solving                              | (similar to above – slightly more mature audience) Brings a focus on the replacement rate, and problem-solving, and connects with systems thinking and Environmental, Economic and Social pillars to support a balanced consideration towards innovation.  | <b>Grades 5 - 8</b>  | <b>**</b>                   |
|                         | <b>Video</b>                                 | <a href="#">The four laws of ecology (link to be provided in July)</a>             | Concise summary of sustainability                                      | Everything in nature is connected to everything else. Everything has to go somewhere. Nature knows best. There is no such thing as a free lunch.   | <b>All educators</b>   | <b>**</b>                   |
|                         | <b>Video</b>                                 | <a href="#">Sustainability (2 mins)</a>  | Recycling-focussed   | Thinking about things that do and don't get used   | <b>Grades 3 and below</b>  |                             |
|                         | <b>Video</b>                                 | <a href="#">Sustainability for kids (3 mins)</a>                                   | Natural cycles of food and the environment                             | Gives some insight into 'natural cycles'.<br><i>Suggest start at 1min 24sec.</i>   | <b>Grades 3 and below</b>  |                             |
|                         | <b>Activity:<br/>Student<br/>Competition</b> | <a href="#">National Online mini solar vehicle (SV) competition</a>                | Free hands-on student solar power activity and competition with prizes | From the many available parts (and permissible alternative options), students construct their own mini SV, try varied configurations and attempt to be the fastest over a 10m track. This activity can also be used to generate an investigation and entry into the National Schools Poster Competition! | <b>Grade 3 and above</b>   |                             |
|                         | <b>Activity</b>                              | <a href="#">Calculate your global footprint</a>                                    | How many planets do we need if everyone lives like you?                | The Ecological Footprint is the only metric that compares the resource demand of individuals, governments, and businesses against Earth's capacity for biological regeneration   | <b>All educators and Grade 3 and above</b>                         |                             |
| <b>Systems Thinking</b> | <b>Video / Activity</b>                      | <a href="#">Demonstrating the interdependence of elements (4 mins)</a>             | Demonstrating systems thinking and interdependence                     | Group demonstration of system of systems – start by looking at your feet!  | <b>Grade 3 and above</b>   | <b>*</b>                    |
|                         | <b>Video</b>                                 | <a href="#">STEM on Demand: Leveraging STEM through Systems thinking (15 mins)</a> | The importance of integrated STEM and the use of systems thinking      | An introduction to systems thinking and its value for supporting a holistic integrated STEM perspective through examples.  | <b>Grade 3 and above (perhaps not all of video for Grades 3-5)</b> | <b>*</b>                    |
|                         | <b>Video</b>                                 | <a href="#">NSW DOE Systems thinking description (7 mins)</a>                      | Explaining systems thinking  | Provides nice overview description of systems thinking and highlights the connection with research, statistics, investigations and broad applicability (across disciplines)  | <b>Grade 1 and above</b>   | <b>*</b>                    |

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|        | <b>Video</b>  | <a href="#">Collective intelligence - systems thinking? (3 mins)</a>              | Realising deep learning is key  | Speaks to the importance of challenging one's own mindset as part of systems thinking, and collaboration (or per Total Quality Management, tapping all knowledge – organisation learning focus (SMART thinking)    | <b>Grade 5 and above</b>   | *                           |
|        | <b>Video</b>  | <a href="#">Introduction to Systems thinking (2 mins)</a>                         | Interrogates the aspect of what is systems thinking                                     | Succinct explanation of systems thinking by leader in the field – from family to business: the web of interconnectedness   | <b>Grade 4 and above</b>   | *                           |
|        | <b>Video</b>  | <a href="#">Understanding the big picture (5 mins)</a>                            | Complex problem solving needs systems thinking  | Use of simple but universal concept of 'love' and the components contributing to that system of love   | <b>Grade 3 and above</b>   |                             |
|        | <b>Video</b>  | <a href="#">From making toast to reclaiming \$50million revenue (9 mins)</a>      | Recognising wicked problems – design exercises  | Recognising how we collaborate – visualising practice (systems upon systems)   | <b>Grade 5 and above</b>   |                             |
|        | <b>Video</b>  | <a href="#">How we think - interdependence (12 mins)</a>                          | Awareness of how we think and operate – mental models                                   | How we need to think about our thinking since the latter (and knowledge) is what we use to make decisions – so are our mental models adequate?   | <b>Grade 5 and above</b>   |                             |
|        | <b>Video</b>  | <a href="#">Systems thinking – connected parts and TQM (4 mins)</a>               | Interconnectedness – key to Business  | Understanding the importance of collaboration - iPhone   | <b>Grade 8 and above</b>   |                             |
|        | <b>Video</b>  | <a href="#">Safety and systems - healthcare (4 mins)</a>                          | Understanding cause-and-effect within systems thinking                                  | Incidents (errors or undesired outcomes) aren't usually due to a single decision or action, rather through dynamic interactions within the underlying system: animation  | <b>Grades 11-12</b>  |                             |
|        | <b>Video</b>  | <a href="#">Systems thinking: cause-and-effect (4 mins)</a>                       | Cause-and-effect within systems thinking: interconnectedness                            | Brings a reflective focus on complex cause-and-effect and how some of the simplest things we consume come to be  | <b>Grade 5 and above</b>   |                             |
|        | <b>Video</b>  | <a href="#">Everything is interconnected – from ecosystems to people (9 mins)</a> | "We cannot solve problems with the same thinking we used when we created them" Einstein | Philippines presenter – suggest start at 1 minute mark. Speaks to mindsets and practices in a softer manner accessible to all ages.<br><br>Examples support presentation to Young (Primary) but also for Secondary | <b>Grade 3 and above</b>   |                             |
|        | <b>Video</b>  | <a href="#">Complexity is increasing – we need systems thinking (3 mins)</a>      | Complexity and interdependence  | Examples of the increasing complexity in life and the need for teams and systems thinking  | <b>Grade 5 and above</b>   |                             |

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|--|---------------|--|--|---|---|---------------------------|
|  | <b>Video</b>  | <a href="#">Why isn't everything solved</a><br>(4 mins)  | Capability and connectedness   | Focuses on the importance of capability and the impact of our 'proximity to benefits' – focussing more on work and less on capability may meet short term targets but that doesn't drive performance: Management Professor  | <b>Grade 8 and above</b>  |                           |
|  | <b>Video</b>  | <a href="#">What is systems thinking?</a><br>(1 min)   | Interrogates the aspect of what is systems thinking  | Succinct (albeit bland) explanation of systems thinking by leader in the field – the web of interconnectedness and considering more than what we see  | <b>Grade 11-12</b>  |                           |
| <b>STEM</b>                            | <b>Video</b>  | <a href="#">WHY STEM</a> (3 mins)  | The importance of STEM, what STEM is and the key skills  | Recognising the importance of transferable skills. Simple overview and inspiration about STEM.  | <b>Grade 3 and above</b>  | *                         |
|  | <b>Video</b>  | <a href="#">What does the future of STEM learning look like? Teachers' Guild of NSW – 2021</a> | <b>Suggested timepoints to view include: 4:00, 6:30, 14:12, 22:14, 27:05, 36:35, 46:00, 49:49, 56:00</b> | Panel discussion on STEM, its intent, the importance of considering as Integrated STEM and the future of STEM   | <b>Educators only</b>   | *<br>Per noted timepoints |
|  | <b>Video</b>  | <a href="#">Problem-solving &amp; improvement is everywhere</a> (2 mins)                       | <b>Data and systems thinking skills for problem-solving</b>  | There are so many unsolved problems – the process of solving problems is critical. The importance of looking at problems through the improvement lens and the varied skills required – speaks of the need to connect systems, statistics, content expert skills – collaboration and improvement (healthcare focus). | <b>Grade 3 and above</b>  | *                         |
| <b>Industry 5.0 and Future of Work</b> | <b>Video</b>  | <a href="#">What is Industry 5.0</a>   | Compares Industry 4.0 and 5.0  | Discusses the aspects of increased efficiency, innovation, creativity and quality, optimising cost and minimising waste. Highlights the need for transferable skills.   | <b>Grades 9-12</b>  | *                         |
|  | <b>Video</b>  | <a href="#">Future of Work</a> (5 mins)  | Routine (automatable) and non-routine jobs   | Head of Economic Analysis (Reserve Bank), Alex Heath, talks about the changing nature of the Australian workforce and the skills that will be highly valued in the future.  | <b>Careers<br/>Grades 11-12<br/>Bus/Econ/TAS<br/>Grades 9-10<br/>Commerce</b> | *                         |

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|        | <b>Video</b>  | <a href="#">Industry 1.0 to 5.0 Summary – computer focus (1 min)</a> | Summary of Industry 1.0 to 5.0 | Potentially of value to DT/TAS and history teachers   | <b>Grades 8-10</b>   |                             |
|        | <b>Video</b>  | <a href="#">Industry 1.0 to 5.0 (3 mins)</a>                         | Innovation is key              | Summarises the key changes in industry and the circular economy. Potentially of value to DT/TAS, history/geography and economics/business teachers. Bit slow/drawn out. | <b>Grades 8-10</b>   |                             |
|        | <b>Video</b>  | <a href="#">Post-covid work (1.5 mins)</a>                           | Adaptive models of work        | A promotional video – speaks to the need to empower people transformation (highlights certain skills which may help inspire students)                                   | <b>Careers<br/>Grades 11-12<br/>Bus/Econ/TAS</b>                   |                             |