To improve student learning.

PYP Review.

Recommendation from PYP Authorization.

Revised Approaches to Learning (ATL) in MYP.

Identified the need to vertically articulate skill development across the school.
Skills in the PYP

Approaches to learning: ages 3-19
- Research skills
- Communication skills
- Social skills
- Thinking skills
- Self-management skills

Approaches to learning (ATL): 2013
- Transdisciplinary skills
- Approaches to learning
- ATL course

Approaches to learning (ATL): 2015
- Approaches to learning
- Approaches to learning
- Approaches to learning
- ATL course

THE IB CONTINUUM
Examples of IB guides

**PYP:**
*Making the PYP Happen* (2009) Transdisciplinary skills.

**MYP:**
*From Principles into Practice* (2014)
Subject-specific guides (2014)
Teacher Support Materials (TSMs)
Further guidance for developing ATL in the MYP.

**DP:**
Approaches to teaching and learning in the DP (Pilot 2013-2014).
Subject guides.
TSMs.

IB Standards and Practices, 2014
THE LEARNER PROFILE
• Skills are documented in planning documents; but are brief and not always linked to a learning engagement and assessed.
• Missed opportunities in formative assessments.
• Skill-developing engagements are taking place but were not well documented.
• Some skills are covered more frequently than others.
• Thinking skills are specifically lacking.
Are we teachers of skills or teachers of content?

http://www.islschools.org/qatar
A skill is the learned capacity to carry out pre-determined results and/or the ability to choose and perform the right technique at the right time, effectively and efficiently.

http://www.redwingexpress.com/blog/the-three-best-hard-skills-to-have/
Washing my car in the UK
A Balancing Act!

Skills

Content
<table>
<thead>
<tr>
<th>PYP-MYP-DP Skill Categories</th>
<th>PYP Skill Clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Speaking, Listening, reading, writing, viewing, presenting, non-verbal communication</td>
</tr>
<tr>
<td>Social</td>
<td>Accepting responsibility, respecting others, cooperating, resolving conflict, group decision making, adopting a variety of group roles</td>
</tr>
<tr>
<td>Self-management</td>
<td>Gross motor skills, fine motor skills, spatial awareness, organisation, time management, safety, healthy lifestyle, codes of behaviour, informed choices</td>
</tr>
<tr>
<td>Research</td>
<td>Formulating questions, observing, planning, collecting data, recording data, organizing data, interpreting data, presenting research findings</td>
</tr>
<tr>
<td>Thinking</td>
<td>Acquisition of knowledge, comprehension, application, analysis, synthesis, evaluation, dialectical thought, metacognition</td>
</tr>
<tr>
<td>PYP-MYP-DP Skill Categories</td>
<td>MYP Skill Clusters</td>
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<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>Communication</td>
<td>Communication</td>
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<tr>
<td>Social</td>
<td>Collaboration</td>
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<tr>
<td>Self-management</td>
<td>Organization</td>
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<td></td>
<td>Affective</td>
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<td>Mindfulness</td>
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<td></td>
<td>Emotional management</td>
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<td>Self-motivation</td>
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<td>Perseverance</td>
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<td>Resilience</td>
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<tr>
<td></td>
<td>Reflection</td>
</tr>
<tr>
<td>Research</td>
<td>Information literacy and Academic Honesty</td>
</tr>
<tr>
<td></td>
<td>Media literacy and Academic Honesty</td>
</tr>
<tr>
<td>Thinking</td>
<td>Critical thinking</td>
</tr>
<tr>
<td></td>
<td>Creative thinking</td>
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<tr>
<td></td>
<td>Transfer</td>
</tr>
<tr>
<td>PYP-MYP-DP Skill Categories</td>
<td>DP Skill Clusters</td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td><strong>Thinking</strong></td>
<td><strong>Critical thinking</strong></td>
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<tr>
<td></td>
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<td></td>
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<td></td>
<td><strong>Reflection</strong></td>
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<tr>
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<td></td>
<td><strong>Resilience</strong></td>
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<tr>
<td></td>
<td><strong>Managing time and Tasks</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Goal setting</strong></td>
</tr>
<tr>
<td><strong>Research</strong></td>
<td><strong>Media, Information literacy</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Academic Honesty</strong></td>
</tr>
</tbody>
</table>
Skills

Most explicitly taught in my school

Least explicitly taught in my school
Transdisciplinary skills are just that – transdisciplinary. Regardless of the programme/curriculum, most inquiry schools recognise some framework of skills and dispositions that are shared across all subject areas. These may include, for example, social and self management skills thinking skills and communication skills.

These skills should be inquired into as part of students’ learning experiences. Highlighting the same skills in specialist programs (not all of them every time – but at least some!) helps students transfer their learning AND widens the scope of inquiry. For example – students exploring ways to give others feedback in the classroom can consciously practice and extend that skill in PE, in art, etc. If any aspect of planning is shared between generalist and specialist teachers I think it should be this.

What we have decided to consider in our planning.

ALL skills need to be explicitly developed.

Almost any skill could potentially be explored in a given unit, so it necessary to be strategic regarding what skill(s) to focus on:

• the learning outcomes/objective strand(s) that are being taught and assessed by criteria.
• the summative task.
• the learning experiences/formative tasks that build to the summative task.
Requirement from Programme Standards and Practices
C2: Written Curriculum

1b: The written curriculum includes an ‘approaches to learning’ planning chart for all years of the programme.

What planning process might we implement in order to meet these requirements?
Self-management skills:

Organization – students will have the opportunity to organise themselves and their group as they put together their presentations.

Time management – students will need to be able to demonstrate that they can work to a given time limit in order to complete the different stages of their life cycle.

Research skills:

Collecting, recording and organizing data – students will be able to choose and animal to research and collect information on this animal. They will need to record and organise the information in a way that will be presented.

Presenting research findings – for the summative assessment the students will choose how to present their research findings with their group to peers, parents and other members of the school community.

Social skills:

Cooperating - students work cooperatively in a group, sharing materials and taking turns while they are working on their summative assessment.

Resolving conflict – students will need to listen carefully to others; compromise and react reasonably to the situation; accept responsibility.
<table>
<thead>
<tr>
<th>Process</th>
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</thead>
<tbody>
<tr>
<td>Cooperated with others.</td>
<td></td>
<td></td>
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<tr>
<td>Used time efficiently.</td>
<td></td>
<td></td>
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<tr>
<td>Showed commitment to the project.</td>
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<tr>
<td>Worked independently during the process.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding of central idea</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Can classify chosen animal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can explain life cycle of chosen animal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can identify 1 difference and 1 similarity between 2 animals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research skills</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Was able to contribute to the chosen animal.</td>
<td></td>
<td></td>
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<tr>
<td>Found relevant information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tried to write in own words.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organized information appropriately.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presentation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Has an appropriate title.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes a diagram of a life-cycle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes at least 1 picture.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing has been edited so it is legible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicated in front of an audience.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses some technical vocabulary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showed confidence during the presentation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research skill</td>
<td>Learning engagement</td>
<td>Formative assessment</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Collecting data</strong>&lt;br&gt;Identifying something one wants or needs to know and asking compelling and relevant questions that can be researched.</td>
<td>Use unit of inquiry books and PebbleGo to collect relevant information about their chosen animal. Find key words from texts about animals; research in library and in class using non-fiction books.</td>
<td>Children look at pictures of butterflies and frogs and a mammal in various stages of development and try to sequence them in the order of development.</td>
</tr>
<tr>
<td><strong>Recording data</strong>&lt;br&gt;Describing and recording observations by drawing, note taking, making charts, tallying, writing statements.</td>
<td>Using varied resources, write information in their own words.</td>
<td>Use subject specific vocabulary.</td>
</tr>
<tr>
<td><strong>Organizing data</strong>&lt;br&gt;Sorting and categorizing information; arranging into understandable forms such as narrative descriptions, tables, timelines, graphs and diagrams.</td>
<td>Sort information under headings. Model simple sentence construction through use of activities that focus on different parts of the sentence e.g. openers, connectives each time.</td>
<td>Students group animals into 2 categories mammals and non-mammals.</td>
</tr>
<tr>
<td><strong>Presenting research findings</strong>&lt;br&gt;Effectively communicating what has been learned; choosing appropriate media.</td>
<td>Write captions underneath pictures. Look at posters around school; discuss common elements (title, pictures, clear font, colour...).</td>
<td>Make an individual poster about an animal.</td>
</tr>
</tbody>
</table>
## Thinking Skills Map EC1-G5

<table>
<thead>
<tr>
<th>Possible learning experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC1</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Acquisition of knowledge</strong></td>
</tr>
<tr>
<td>Gaining specific facts, ideas, vocabulary; remembering in a similar form.</td>
</tr>
<tr>
<td><strong>Comprehension</strong></td>
</tr>
<tr>
<td>Grasping meaning from material learned; communicating and interpreting learning.</td>
</tr>
<tr>
<td><strong>Application</strong></td>
</tr>
<tr>
<td>Making use of previously acquired knowledge in practical or new ways.</td>
</tr>
</tbody>
</table>
Where do we go from here?

**PYP:**

- Continue to document skill development throughout the year
- Work more closely with single subject teachers to focus on shared understanding of skill development
Choosing the skills for your unit

• Examine a learning outcome/objective strand from your own unit. Determine what thinking skills are inherent in the learning outcome/objective strand?

• How will the student be expected to demonstrate these skills? (learning engagement/performance of understanding)

Note:
How will you determine the level of achievement of those skills?
Unit Plans

Continue to revise our subject-specific unit plans in light of 2014 guides by the end of the 2014 to 2015 academic year using the new unit plan on ManageBac. Careful attention will be paid to the alignment of MYP objective strands to ATL skills that will be developed in the learning experiences section of the unit plan. Those skills will be measured by the summative assessment tasks but students will also receive ongoing formative feedback from the teacher as the skills are taught within the learning process.

Horizontal Planning

Teachers to meet every 2 weeks for 30 minutes in subject year groups (Year 1, etc.) to discuss how to design learning experiences around the ATL skills that were agreed upon for the unit that is currently underway.

Vertical Planning

Teachers to meet every 4 weeks with their subject groups for 60 minutes to discuss their approach to ATL skill development with input from the MYPC and ATLC who have a broad picture of the ATL development process.
Student self-assessment

Students at ISL Qatar have always been given opportunities to reflect on their learning – end-of-unit, end-of-calendar year, written reports, etc. We would now like students to focus more explicitly on how they perceive their own skill learning and development. Currently, students in Years 1 through 3 create a reflection portfolio based on the ATL skills. The ATL skills need to become more of a centerpiece for the portfolio as we ask the students to reflect and conduct a self-assessment of the skills developed and manifested in their work.
The Projects

- Community Project: Year 3 students will have the opportunity to consolidate their community service/action experiences through the community project. This will be an opportunity for students to use certain ATL skills as they complete this project.

- Personal Project: Year 5 students will continue to use this component of the programme to demonstrate their knowledge in one or more of the ATL skills.
Implicit in the way we teach

Implicit in the way we teach?
Should they be?
Can they lead to deeper learning and understanding?
### Activity 1: The essential idea

**Essential Idea:** Membranes control the composition of cells by active and passive transport.

### Activity 2: Passive transport

- **Understanding:** Particles move across membranes by simple diffusion, facilitated diffusion, osmosis and active transport.
- **Application:** The function of the human kidney by using appropriate membranes and diffusion gradients.
- **Alms:** Kidney dialysis artificially mimics the function of the human kidney. Topic 6.5 Neurons and synapses.

### Activity 3: CALP

### Activity 4: Active transport

### Activity 5: Investigation into osmolarity

**The nature of science:** Guidance for simulations and investigations

### Activity 6: Kidney Dialysis

### Activity 7: Organ donation

### Activity 8: Transport of larger particles

### Activity 9: Summary sheet

---

**1.4 Membrane transport**

**Nature of solences:** Experimental design—accurate quantitative measurement in osmosis experiments are essential.

**Utilization:**
- Kidney dialysis artificially mimics the function of the human kidney. Topic 6.5 Neurons and synapses.

**Alms:**
- Kidney dialysis artificially mimics the function of the human kidney. Topic 6.5 Neurons and synapses.

**Applications and skills:**
- Application: Structure and function of sodium-potassium pumps for active transport and potassium channels for facilitated diffusion in axons.
- Application: Tissues or organs to be used in medical procedures must be bathed in a solution with the same osmolarity as the cytoplasm to prevent osmosis.
- Skill: Estimation of osmolarity in tissues by bathing samples in hypotonic and hypertonic solutions. (Practical 2)

**Guidance:**
- Osmosis experiments are a useful opportunity to stress the need for accurate mass and volume measurements in scientific experiments.
### 1.1 Introduction to cells

#### Nature of science:
Looking for trends and discrepancies—although most organisms conform to cell theory, there are exceptions. (3.1)
Ethical implications of research—research involving stem cells is growing in importance and raises ethical issues. (4.5)

#### Understandings:
- According to the cell theory, living organisms are composed of cells.
- Organisms consisting of only one cell carry out all functions of life in that cell.
- Surface area to volume ratio is important in the limitation of cell size.
- Multicellular organisms have properties that emerge from the interaction of their cellular components.
- Specialized tissues can develop by cell differentiation in multicellular organisms.
- Differentiation involves the expression of some genes and not others in a cell’s genome.
- The capacity of stem cells to divide and differentiate along different pathways is necessary in embryonic development and also makes stem cells suitable for therapeutic uses.

#### International-mindedness:
- Stem cell research has depended on the work of teams of scientists in many countries who share results thereby speeding up the rate of progress. However, national governments are influenced by local, cultural and religious traditions that impact on the work of scientists and the use of stem cells in therapy.

#### Theory of knowledge:
- There is a difference between the living and the non-living environment. How are we able to know the difference?

#### Utilization:
- The use of stem cells in the treatment of disease is mostly at the experimental stage, with the exception of bone marrow stem cells. Scientists, however, anticipate the use of stem cell therapies as a standard method of treating a whole range of diseases in the near future, including heart disease and diabetes.

### Aims:
- **Aim 8:** There are ethical issues involved in stem cell research, whether humans or other animals are used. Use of embryonic stem cells involves the death of early-stage embryos, but if therapeutic cloning is successfully developed the suffering of patients with a wide variety of conditions could be reduced.

#### Applications and skills:
- Application: Questioning the cell theory using atypical examples, including striated muscle, giant algae and aseptate fungal hyphae.
- Application: Investigation of functions of life in *Paramecium* and one named photosynthetic unicellular organism.
- Application: Use of stem cells to treat Stargardt’s disease and one other named condition.
- Application: Ethics of the therapeutic use of stem cells from specially created embryos, from the umbilical cord blood of a new-born baby and from an adult’s own tissues.
- Skill: Use of a light microscope to investigate the structure of cells and tissues, with drawing of cells. Calculation of the magnification of drawings and the actual size of structures and ultrastructures shown in drawings or micrographs. (Practical 1)

#### Guidance:
- Students are expected to be able to name and briefly explain these functions of life: nutrition, metabolism, growth, response, excretion, homeostasis and reproduction.
- *Chlorella* or *Scenedesmus* are suitable photosynthetic unicells, but *Euglena* should be avoided as it can feed heterotrophically.
- Scale bars are useful as a way of indicating actual sizes in drawings and micrographs.
Cholesterol article
Scanning and high lighting main points to construct a brief list of what cholesterol is used for in the body

**Transfer** (from English reading)

Class discussion on what makes a good model
Concentrate on the predictive aspects

**Meta cognition** (how we know what we know)

Stop motion animation on construction of a Membrane
Include how phospholipid maintain structure (weeble!!)

**Creative thinking**

Within guide transfer!

Look at Diagrams of the two models
Compare to what we know about membranes
Look at the TEMs web page of Membranes
Use series of questions to get students to ask the correct questions

**Critical thinking**
## Planning and Scope and Sequence documents

<table>
<thead>
<tr>
<th>Date WE week</th>
<th>Topic/Theme</th>
<th>Chapter/page in text/Resources specific text has chapters</th>
<th>LE (Learning engagements)</th>
<th>practical/activity (PSOW)</th>
<th>skill/objective</th>
<th>Homework</th>
<th>Work sheets</th>
<th>ToK</th>
<th>ATL</th>
<th>Summative</th>
<th>Formative</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/09/2014</td>
<td>1</td>
<td>Introduction Stats</td>
<td>Web pages only?</td>
<td>The bean activity, learning how to use excel, simple writeup, QA and Notes on SD distribution graphs, 1 measuring beans kidney beans, 2 how to use Stats, implications and limitation of stats</td>
<td>Write up labs</td>
<td>Excel use, SD and Ttest, is it true in Biological experiments</td>
<td>transfer (looking for universal application)</td>
<td>writeup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14/09/2014</td>
<td>2</td>
<td>Microscopes animal and plant, hay culture</td>
<td>1 Mrs Gren activity and the rock, 2 Cell time line linked to cell theory, 3 SA/Vol Calculation, 4 SA/Vol Agar Gel activity, 5 Table of advantaged/disadvantage of multi/ uni cell, 6 Stem cell research (stargardts disease) and presentation, 7 microscopes looking at cells</td>
<td>Microscope (2 hrs)</td>
<td>Microscopes</td>
<td>Complete activities</td>
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<tr>
<td>21/09/2014</td>
<td>3</td>
<td>Tems various cells</td>
<td>1 Cell time line link to equipment (microscope fast poster), 2 Eu/pro cell activity, 3 drawing Pro and Eu cells and annotate, 4 QA regarding perception and first hand observations</td>
<td>Eu/pro cells</td>
<td>Drawing cells, interpreting TEMs</td>
<td>How do we know (Cell theory)?</td>
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</tbody>
</table>

### Subject: Biology

### Year: 2014- Grade: 11

You may want to divide course into Sections.

<table>
<thead>
<tr>
<th>Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 R+ CT, 2 CreT, 3 Comm+ R 3 Comm+R 4 CT+Comm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Planning and Scope and Sequence documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>This document outlines the planning and scope and sequence of a biology course for Year 2014 in Grade 11. It includes a detailed schedule of topics and themes, along with specific activities and resources for each lesson. The document also notes assessments and learning outcomes for each week, providing a clear roadmap for both teachers and students.</td>
</tr>
</tbody>
</table>
Another way
Models of membranes

We will make notes about this and share via Managebac, you can then change your notes after looking at others (Reflection)

In the 1930 Davson and Danielli proposed the model below

![Figure 4 Danielli-Davson model](image)

Why was this a good model? What makes a good model (predictive nature)

(do a little research)

Why is this model good, what is good about it, what are the problems?

An alternative model was suggested by Sanger and Nicolson in 1972

![Alternative model](image)

What advantage does this model have?

(Do a little research)

Check out


Why did we change our understanding of the model of membranes?

(Three pieces of documented evidence)

How does this fit with our understanding of how science works?

(clue falsification theory)
How is research taught?

- Lib guides
- Use of a tool such as Noodle tools
- A consistent citation system

Do we need a continuum for these skills?
Thinking skills

PYP (Grade 4)
Describing perspectives: in character, as part of the ‘living museum’, the explorer explains their perspectives of their discovery and also explains the impact of their exploration from the others’ perspectives.

MYP
Looking at different travel writing elements, consider their different impact on an audience.

DP
Looking at different models of plasma membranes. Making a list/table of the similarities and/or differences. Evidence for both.
Using the ideas to draw a conclusion about the material (can also be used to build on the concept of models in Science)
The DP Approach?

Through questions
Link to how it has been done

Meta cognition
Ask how do we know? What did you do to learn this?

Reflection
What did you do? What did you learn? What did you do well? How might it have been better?

Creative
What changes did you make? Are they useful?

Critical
What is the evidence? Does it all agree? Which is more important?

Transfer
Have we used this somewhere else? Can we use this somewhere else?
Where do we go from here?

All three programmes:

• approach the teaching and reinforcement of skills within and across the programmes.

• What will be the best way to teach the skills at our school – implicitly or explicitly – and a consistent model?

• use whole school meetings and professional learning days to further skill development and mapping.
Where do we go from here?

Mapping the skills across the continuum

Kim McDonald, PYP Coordinator
Jill Shadbolt, PYP Coordinator
Helen Jeffery, MYP Coordinator
Joe Hamkari, DP Coordinator
The Exit Card

Reflections and emails

We would like to compile and send on to the participants after the conference, your responses to the following:

How does/will your school ensure that students experience a continuum of skill development and application?