**Levels 9/10 Languages Activity**

**The Prefectures of Japan**

**Introduction to Numeracy in languages**

Languages is a uniquely diverse subject area. Students in Victoria study over 70 languages in government schools, out-of-school-hours programs, distance education modes, and accredited community language schools (Department of Education and Training, 2018). These languages are divided into the six categories of Aboriginal languages, sign language (Auslan), character languages (Chinese and Japanese), Classical Greek and Latin, Roman alphabet languages, and non-Roman alphabet languages. As a whole, engaging in language learning “extends students’ literacy repertoires and their capacity to communicate. It strengthens students’ understanding of the nature of language, culture, and the processes of communication” (Victorian Curriculum and Assessment Authority [VCAA], n.d.). Though these outcomes are not explicitly linked to numeracy skills, the cognitive aspect of learning an additional language and the opportunities that language teachers have to incorporate a wide range of content in language curricula open up numerous opportunities for teachers to consolidate and expand students’ numeracy capabilities in tandem with developing their language proficiency.

As Adoniou and Qing (2014) suggest, the language of mathematics can be challenging for all students, not only English language learners. These challenges include:

* technical language and specific meanings of everyday terms (e.g., table, function, product)
* concepts that are expressed in word problems
* rules and conventions around syntax and mathematical procedures (e.g., BEDMAS)

The importance of literacy for engagement and achievement in mathematics has been explored in a number of studies (Burke, 2018; Jourdain & Sharma, 2016; Kotsopoulos, 2007; Meiers & Trevitt, 2010; Prediger et al., 2018; Walzebug, 2014). As shown in these studies, if students’ literacy levels are developed and students are given the tools required to understand the language of mathematics, then learning outcomes can be enhanced. This relationship between literacy levels and numeracy is partly due to the central role that language plays in the process of making and sharing meaning, since language is the *a priori* necessity for the realisation of meaning (Lankshear, 1997).

Based on an analysis of mathematical literacy items from the Programme for International Student Assessment (PISA), Turner (2010) emphasised the role that language plays in developing numeracy, since “mathematical literacy in practice involves communication” (p. 58). Turner pointed out that understanding and clarifying a worded mathematical problem is dependent on reading, decoding, and interpreting statements, questions, tasks, and/or objects. By engaging in these processes, students are able “to form a mental model of the situation, an important step in understanding, clarifying and formulating a problem” (Turner, 2010, p. 58). Similarly, learning an additional language can develop students’ literacy repertoires and their “understanding of the nature of language, culture and the processes of communication” (VCAA, n.d.). This expansion of students’ linguistic repertoires, and the enhanced ability to analyse how language works through the study of an additional language, can provide students with linguistic knowledge that can be transferred to the mathematics classroom.

**Developing Numeracy Understanding in Languages**

Teachers are required to provide opportunities for students to develop numeracy skills in an applied environment, and there are numerous ways to incorporate meaningful numeracy-related learning in language classrooms. Language teachers can use the curriculum strands and sub-strands as conceptual maps to plan for and develop students’ numeracy capabilities. Apart from Classical Greek and Latin, all languages curricula contain the interrelated strands of Communicating and Understanding. Communicating refers to using language for communicative purposes in interpreting, creating and exchanging meaning (VCAA, n.d.). Understanding refers to analysing and understanding language and culture as resources for interpreting and shaping meaning in intercultural exchanges (VCAA, n.d.). Both strands are further refined into several sub-strands, and the following section is an introduction to how numeracy knowledge and skills can be embedded into some of these sub-strands.

In the Communicating strand, numeracy-related learning will resemble some of what the student already does in their first language. In this case, “learning languages affords opportunities for learners to use the target language to develop skills in numeracy, to understand, analyse, categorise, critically respond to and use mathematics in different contexts” (ACARA, n.d.). While language teachers may not have numeracy as an explicit learning outcome, much of this learning currently takes place in beginner language learning, and the vocabulary and grammatical structures are typically found in most language teaching resources. Examples include:

* recognising and sequencing numbers (e.g., in language games)
* using numbers to discuss dates and ages
* using whole numbers, percentages, and fractions when analysing questionnaires
* doing basic operations (addition, subtraction, multiplication, and division)
* telling the time and talking about the duration of events
* discussing travel itineraries and timetables
* asking for and giving prices of goods
* discussing measurements and quantities for recipes
* calculating currency exchange rates

The following two sub-strands within Communicating also include meaningful opportunities for numeracy development:

* Socialising refers to students engaging in activities requiring planning, negotiating, deciding, and taking action. As is the case in their first language, students will sometimes need to utilise numeracy skills and knowledge to carry out planning activities.
* Informing refers to students obtaining, processing, interpreting, and conveying information in oral, written, or multi-model texts.

Another area of language learning where numeracy can be developed is where differences exist in how numeracy-related concepts and processes exist in other cultural and linguistic systems. In the Understanding strand, the sub-strands of Systems of Language and the Role of Language and Culture include opportunities to explore how numeracy is shaped and continually influenced by different cultural contexts and linguistic systems. Some of these differences pertain to:

* conventions (e.g., the use of a comma instead of a period for the decimal point when writing numerals in Italian such that the cost of an item that is two euros and 49 cents is written as €2,49)
* counting systems (e.g., in Japanese, the unit of ten thousand is used as a denomination for counting and currency, such that the number 100,000 is read as ‘10 ten-thousands’)

The cultural significance of numbers is also a rich area for students to explore. For instance, students can investigate the use of numbers in metaphors, proverbs, and traditional stories in the target language.

**Lesson Plan: The Prefectures of Japan**

The prefectures of Japan are diverse in numerous ways, including but not limited to their climates, geographical features, cuisines, and cultural traditions. This diversity across the 47 prefectures can be a rich source of learning opportunities for students to undertake an in-depth study of a selected prefecture. In doing so, each student becomes the ‘classroom expert’ for their selected prefecture and is then able to engage in multiple communication and cultural interactions with other students, sharing the knowledge of their prefecture and learning about other prefectures from classmates. Numeracy knowledge and skills can also be developed as students analyse, create, and communicate information such as climate data, geographical features, and population statistics of Japan’s prefectures.

This task-based language activity will take a minimum of four classes to complete. Although this example is for Japanese, it is suitable for all languages where there is sufficient diversity in the countries and regions where the target language is spoken, such that each student is able to research one region and collect information to share with their peers. Students work towards creating a narrated blog/video journal as the final product to be assessed. Beyond this final product, numerous opportunities exist for meaningful language use during the process of creating the blog/journal. To encourage students to use the target language as much as possible, the overall grading should include allocations for use of target language during activities.

**Prerequisite/Corequisite Knowledge: Japanese**

The unit is based on the 7–10 sequence, with most students beginning their Japanese studies in Year 7. For those students who have studied Japanese in primary school (F–10 sequence), there are multiple differentiation options for appropriate extension activities. To engage with this task, students will consolidate their knowledge of the following topics:

* Japan’s system of prefectures
* key features and diversity between prefectures in terms of climate, physical and human geography, and economic activity
* vocabulary for describing geographical features
* vocabulary for describing climate and weather
* vocabulary related to time, duration, and distance
* vocabulary related to festivals and traditions
* Japanese counting systems, using units of 10, 100, 1,000 and 10,000 and associated kanji (e.g., 百、千、万)

Students will develop and consolidate the following skills:

* use Japanese in classroom interactions and short communicative tasks
* listen to and read texts to obtain specific details and/or to understand general meaning
* understand and apply rules or patterns to elements of Japanese grammar, including word order, simple verb forms, nouns, adjectives, and particles
* use modelled examples and apply knowledge of language features to create texts for informative, personal, or descriptive purposes
* develop a working knowledge of how the three scripts (hiragana, katakana, and kanji) are used to create meaning
* develop proficiency in reading and writing hiragana, and use high-frequency katakana and kanji to read and write words and sentences
* begin to use vocabulary and grammar accurately, drafting and editing texts to improve structure and to clarify meaning

**Background Mathematical Skills and Understandings**

Teachers of Languages are not expected to teach the mathematical knowledge and skills that students will draw on when engaging with this activity. The students will have learnt and should be adept with the required mathematical knowledge and skills to complete the activity. According to the Victorian Curriculum: Mathematics, the required mathematical knowledge and skills should have been developed in earlier years of schooling, that is, by the end of Level 8.

For this activity, the background mathematical skills and knowledge are:

* reading maps to identify regions and features
* knowledge of metric measurement units: temperature and length
* knowledge of percentages
* knowledge of mean (average)
* knowledge of area; students may need to be reminded of the use of the unit km2 in relation to land size
* using population and area data to derive population density (with calculators)
* interpreting data represented graphically and in tables, and extracting pertinent data
* representing data visually in graphs or tables, with or without the use of technology

**Lesson Description**

In the following description, the core activities for approximately four classes are listed. These activities are designed to promote the development of all the five macro skills (speaking, listening, reading, writing, and viewing), as well as multiple opportunities for numeracy integration. As language classrooms vary greatly, the order and inclusion/exclusion of activities can be modified by the teacher to suit the needs and circumstances of their students.

***Scenario***

You have just returned from a two-week school trip to a prefecture in Japan. During that trip, you were able to experience a traditional cultural event (e.g., festival) specific to that prefecture. You learned that many of the traditional festivals celebrated throughout Japan are often connected to the seasons, and that tourism in the prefecture that you visited is influenced by the typical weather patterns. You have collected data on the climate in your prefecture (e.g., temperature, rainfall) and investigated how the climate influences traditional festivals, tourism, and agricultural produce from the prefecture. Create a narrated blog/visual journal about the prefecture as an informative text for your peers.

***Suggested Activity Sequence***

1. The teacher distributes a map of Japan with prefectures labelled in kanji and furigana (see sample in appendix). Working in pairs, students listen to the teacher’s verbal clues (in Japanese) to figure out which prefecture the teacher is discussing. Some example clues are: the largest, smallest, widest, narrowest prefecture; the hottest, coldest prefectures; the most northerly, southerly, westerly, easterly prefectures; prefecture names that have kanji for body parts, adjectives, numbers, geographical features; most complex characters, simplest characters.
2. The teacher tells the class about a trip (real or fictional) that the teacher made to a Japanese prefecture and informs students that they are going to watch and listen to a narrated visual journal about that prefecture (e.g., PPT, video, Prezi). The teacher presents a visual journal that contains examples of the information that students need to research and collect for their visual journal (see suggested list below). Some of the information in the suggested list below should be represented using tables and/or graphs (e.g., climate data, tourist numbers by month/season).
3. During the presentation, the teacher pauses to ask questions and/or invites students to ask questions (in Japanese or English). The teacher’s visual journal and transcript should also be uploaded to a shared site (e.g., school intranet, Google Classroom) for students to access on demand for additional listening and reading practice as they work on their visual journal.
4. Students choose (or are allocated) a prefecture to research (see appendix for useful websites with information in Japanese and English). For additional scaffolding, students can be provided with a sample template based on the teacher’s presentation, along with a glossary of key words and phrases.
5. Students work individually to gather the information about their prefecture and to draft their visual journal. The journal should include at least three graphs and/or tables to present some of the data. The teacher checks on each student’s progress by using the key vocabulary and phrases in one-on-one conversations with students (formative assessment). Additional research and drafting can be set for homework.
6. When students have completed their first draft, they work in pairs or trios to present their visual journal (in Japanese) and to ask and answer questions (in Japanese). As a peer assessment task, students can provide feedback to each other using the assessment rubric.
7. Students use the feedback to develop a final version of the visual journal and a written transcript (in Japanese). They record this narration, and are able to practice and redo the narration as required. By listening to the recording of their narration, students develop their ability to identify areas for improvement, thus enhancing their metalinguistic skills.
8. Students upload their visual journal files for on-demand access by the rest of the class. Students view and listen to three to four other presentations, and take notes and write a summary of the key information from each presentation. These summaries of numerical data (area, population, climate, etc.) can be used to make comparisons between the prefectures and to practice writing sentences using comparative and superlative forms.
9. Where there is more than one Levels 9/10 class, students can view the visual journals of students in other classes to compare presentations on the same prefecture, and to learn about prefectures not included in their class’s section. This sharing of student-created resources expands the variety of input and reinforces to students their growing capacity to be producers and not just consumers of language resources.

***Suggested Topics for Students to Research***

* size of prefecture (area in km2)
* climate (average temperatures and rainfall at different times of the year)
* terrain and geographical features (percentage of urban areas, rural forest, etc.)
* total population and population density (number of people per square km)
* famous places and festivals
* tourism data (number of visitors by month/season, etc.)
* local specialities and traditions
* major agricultural products and industries

**Table 1: Links to the Victorian Curriculum – Japanese**

|  |  |  |
| --- | --- | --- |
| Strand and Sub-Strand | Content Description | Elaboration(s) |
| Communicating* Socialising
 | Initiate and sustain interactions to share experiences, personal opinions, aspirations, thoughts and feelings and to discuss aspects of young people’s experience (VCJAC019)Participate in activities that involve transacting, negotiating, planning and participating in events and experiences (VCJAC020) | Developing strategies to initiate and sustain interactions, such as asking for clarification or confirmation, acknowledging and showing interest, using appropriate gestures and expressions such as あいづち, ああ　そうですか。いいですね。そうですね。 へえ。はい　うん。Maintaining and extending conversations by requesting additional information, asking appropriate questions, and using conversation fillers such as いつしますか。だれとしますか。 どうですか。Providing evidence or reasons to justify own opinions or planned actions, for example, べんりです。 だからコンビニで買ものをします。planning and completing tasks involving authentic or simulated transactions, for example, planning a holiday, purchasing goods, ordering food or making requests by email or text message, negotiating and making decisions about services, such as ordering in shops and restaurants, specifying size, number and colour where relevant, and commenting on products, for example, おこのみやきを二つください。おいしそうですね。むらさきのLサイズをください。かわいいですね 。Creating a digital presentation or performance to present information about their own school to a Japanese sister school or Japanese visitorsplanning social events, negotiating and making shared decisions, and creating associated texts, such as invitations or posters for an excursion or for activities for Languages Week, for example, 八時に学校の前で会いましょう。それから学校のバスで行きましょう、 八時ちょっと前に来てください。role-playing scenarios related to travelling or living in Japan, for example, interactions with a host family or using public transport |
| Communicating* Informing
 | Access ideas and information from a range of spoken, print and multimodal texts, compare views, state opinions, and present information in different formats to inform or interest others (VCJAC022)Convey factual information, ideas and opinions using different modes of presentation that take account of context, purpose and audience (VCJAC023) | Examining factual information from a range of print, online/web-based travel and leisure texts, using it to compare options and make suggestions, for example, しんかんせんはとても高いですが、べんりだと思もいます。東京から京都まで二時間半かかります。バスで八時間ぐらいかかります。Understanding the gist and recording specific details from texts such as websites, newspaper articles, documentaries, reports or podcasts on topics such as popular culture, schools, sports or leisure activities in JapanObtaining and using information from a range of media texts, including television weather reports, interviews and digital video clips, and summarising key points through presentation modes such as graphs, charts, diagrams, and written or digital reportsPreparing and presenting/publishing an article for a magazine, e-journal or website with a specified audience in mind, for example, a film review for young learners of Japanese or a digital travel guide for a proposed visit to JapanCreating texts to inform others about or promote events, places or experiences, such as a poster or flier for a multicultural event or a brochure about their school for a Japanese audience, for example, ミュージカルにきてください。私の学校にようこそ。 |
| Communicating* Creating
 | Create own or shared texts in different modes and formats to inform or entertain others, or express ideas, attitudes and perspectives, using imaginary characters, places and experiences (VCJAC025)  |  |
| Understanding* Systems of language
 | Understand the intonation and phrasing patterns of spoken Japanese; and recognise that most kanji have more than one ‘reading’ and that the pronunciation changes according to kanji compounds (VCJAU030)Convey meaning by appropriately selecting and combining hiragana, katakana and kanji characters, and use understanding of kanji to predict meaning of unfamiliar words (VCJAU031)Understand the systematic nature of Japanese language and grammatical forms, and explore how to use/combine these elements to express complex ideas (VCJAU032)Use a range of textual conventions in spoken, written and multimodal texts, and understand how different scripts are used to convey meaning or effects (VCJAU033) | Understanding how to make appropriate pauses in a sentence, dividing the sentence into cohesive chunks to allow for the use of あいづちunderstanding that changes occur in kanji readings, for example, 一月、 月曜日Recognising that many kanji have multiple readings and that there are two types of readings, that is, on-yomi (音; on ‘reading’ or ‘sound’), Chinese-style pronunciation; and kun-yomi (訓; kun ‘reading’ or ‘explanation’), Japanese-style pronunciationDeveloping strategies to guess the meaning of unknown words that contain familiar kanji, for example, 小学校、 中学校 |

**Table 2: Links to the 21st Century Numeracy Model (Goos et al., 2014)**

|  |  |
| --- | --- |
| Aspect of the Model |  How This Aspect is Addressed by the Lesson |
| **Attention to Real-Life Contexts*** Citizenship
* Work
* Personal and Social Life
 | Students will develop practical map reading skills through identifying the diverse regions and features of Japan. By learning about the diversity within Japan, students will deepen their understanding of the similarities and differences within and between cultures. Increasing students’ intercultural understanding in this way can have positive impacts on students’ personal and social lives. |
| **Application of Mathematical Knowledge*** Problem Solving
* Estimation
* Concepts
* Skills
 | Students can make use of, and sense of, the data such as rainfall averages, temperature ranges, population density, and land types collected from a range of websites. Students will learn how to interpret climate data and consider the connections between climate and seasonal variations with human activities such as traditional festivals, tourism, and the production of agricultural goods. |
| **Use of Tools*** Physical
* Representational
* Digital
 | Students will use digital tools (computers, iPads, etc.) to explore data and present the data using suitable representational tools (column graphs, pie charts, etc.). |
| **Promotion of Positive Dispositions*** Confidence
* Flexibility
* Initiative
* Risk
 | Students will feel confident to show initiative to select, use, and interpret mathematics in their investigations of a prefecture of Japan. As many, if not all, of these students have chosen to continue with Japanese studies beyond the compulsory years, they will be willing to engage with and then persist when challenged by graphical representations of authentic data. The links to the real-life data on climate, geography, population, tourism, and economic activity will enhance students’ disposition towards mathematics. |
| **Critical Orientation*** Interpreting Mathematical Results
* Making Evidence-Based Judgements
 | Students will develop an interpretive, evaluative, and analytical stance towards the data collected about their prefecture by providing explanations for the patterns observed in the data for their prefecture and by comparing data across multiple prefectures. Students will make comparisons between prefectures based on the data presented and use these comparisons to make evidence-based summaries of the prefectures. |

**References**

Adoniou, M., & Yi, Q. (2014). Language, mathematics and English language learners. *The Australian Mathematics Teacher*, *70*(3), 3–13.

Australian Curriculum, Assessment and Reporting Authority. (n.d.). *General capabilities*. <https://www.australiancurriculum.edu.au/f-10-curriculum/languages/general-capabilities/>

Burke, R. (2018). Language and culture in the mathematics classroom: Scaffolding learner engagement. In M. Sellars (Ed.), *Numeracy in authentic contexts: Making meaning across the curriculum* (pp. 91–109). Springer. <https://doi.org/10.1007/978-981-10-5736-6_6>

Department of Education and Training. (2018). *Languages provision in Victorian government schools*. <https://www.education.vic.gov.au/Documents/school/teachers/teachingresources/discipline/languages/eduState-languages-provision-report-2018.pdf>

Jourdain, L., & Sharma, S. (2016). Language challenges in mathematics education: A literature review. *Waikato Journal of Education*, *21*(2), 43–56.

Kotsopoulos, D. (2007). Mathematics discourse: It’s like hearing a foreign language. *Mathematics Teacher*, *101*(4), 301–305. <https://www.nctm.org/Publications/mathematics-teacher/2007/Vol101/Issue4/?ref=1>

Lankshear, C. (1997). *Changing literacies*. Open University Press.

Meiers, M., & Trevitt, J. (2010). Language in the mathematics classroom. *The Digest, NSWIT & ACER Research Digest, 2010*(2). <https://research.acer.edu.au/cgi/viewcontent.cgi?article=1006&context=digest>

Prediger, S., Wilhelm, N., Büchter, A., Gürsoy, E., & Benholz, C. (2018). Language proficiency and mathematics achievement: Empirical study of language-induced obstacles in a high stakes test, the central exam ZP10. *Journal Für Mathematik-Didaktik*, *39*, 1–26. <https://doi.org/10.1007/s13138-018-0126-3>

Turner, R. (2010). *Identifying cognitive processes important to mathematics learning but often overlooked* [Paper presentation]. Teaching Mathematics? Make it Count. Australian Council for Educational Research Conference. <https://research.acer.edu.au/research_conference/RC2010/16august/15>

Victorian Curriculum and Assessment Authority. (n.d.). *Languages - About the Languages -Victorian Curriculum*. <https://victoriancurriculum.vcaa.vic.edu.au/languages/introduction/about-the-languages>

Victorian Curriculum and Assessment Authority. (n.d.). *Learning about Asia and Australia’s engagement with Asia*. <https://victoriancurriculum.vcaa.vic.edu.au/static/docs/Learning%20about%20Asia%20CCP.docx>

Walzebug, A. (2014). Is there a language-based social disadvantage in solving mathematical items? *Learning, Culture and Social Interaction*, *3*(2), 159–169. <https://doi.org/10.1016/j.lcsi.2014.03.002>

**Appendix**

***Information about Prefectures and Tourism***

Japan Foundation: Regional Specialities of Japan: <https://jpf.org.au/classroom-resources/resources/regional-specialities-of-japan/>

Japan Foundation: Tokyo Sightseeing with Relative Clauses: <https://jpf.org.au/classroom-resources/resources/tokyo-sightseeing-with-relative-clauses/>

Japan Travel Bureau: <https://www.japan.travel/en/au/>

Kids Web Japan: Explore Japan: <https://web-japan.org/kidsweb/explore/>

Wikipedia: Prefectures of Japan: <https://en.wikipedia.org/wiki/Prefectures_of_Japan>

***Information about Climate and Seasons***

Index of Japan Climate Charts: <https://www.climate-charts.com/Countries/JAPAN.html>

Japan: Seasons: <https://livejapan.com/en/go-visiting/go-seasons/>

***Prefecture Maps (with and without Kanji, Hiragana, and Romaji)***

<https://insidethatjapanesebook.files.wordpress.com/2018/04/japan-prefectures-map-only.pdf>

<https://insidethatjapanesebook.files.wordpress.com/2018/04/japan-prefectures-kanji-only.pdf>

<https://insidethatjapanesebook.files.wordpress.com/2018/04/japan-prefectures-kanji-and-furigana.pdf>

<https://insidethatjapanesebook.files.wordpress.com/2018/04/japan-prefectures-kanji-and-english.pdf>