

*HINDI*

## थीम 1: सुनना और बोलना

बच्चे अपने आस-पास की परिस्थितियों एवं परिवेश का अवलोकन करते हैं और अपने अनुभवों और विचारों को मौखिक रूप से अभिव्यक्त करते हैं। टी०वी०, रेडियो आदि पर विभिन्न कार्यक्रम सुनकर – देखकर उनपर अपनी समझ बनाते हैं। अतिथियों के भाषण आदि सुनकर भी समझते हैं। स्थिति और संदर्भ के अनुकूल औपचारिक या अनौपचारिक भाषा का प्रयोग करते हैं।

### अधिगम उपलब्धियाँ (Learning outcomes):

- ✓ विद्यालय में आयोजित प्रतियोगिताओं और समारोहों में प्रस्तुत कविता पाठ, कहानी कथन, नाटक, वाद – विवाद, भाषण आदि को समझते हुए सुन सकेंगे।
- ✓ पठन सामग्री को सुनकर निष्कर्ष निकाल सकेंगे और अपना मत बना सकेंगे।
- ✓ किसी विषय सामग्री को सुनकर उसकी मुख्य बातें और विचारों को समझ सकेंगे तथा उसमें कार्य-कारण संबंध स्थापित कर सकेंगे।
- ✓ सुनी गई विषय वस्तु के आधार पर क्यों, कैसे, कब, कहाँ, अनुमान आदि प्रश्नों के उत्तर स्पष्ट उच्चारण के साथ पूरे – पूरे वाक्यों में दे सकेंगे।
- ✓ बोलने के शिष्टाचार का पालन कर सकेंगे।
- ✓ किसी कार्य या गतिविधि विशेष के लिए दिए गए निर्देशों को समझेंगे तथा साथियों को निर्देश व संदेश दे सकेंगे।
- ✓ समूह चर्चाओं में भाग ले सकेंगे।
- ✓ स्थिति और संदर्भ के अनुकूल औपचारिक या अनौपचारिक भाषा का प्रयोग कर सकेंगे।
- ✓ अपने अनुभवों, भावनाओं, विचारों, एवं मतों को प्रवाह के साथ अपनी भाषा में अभिव्यक्त कर सकेंगे।

## सुनना और बोलना

| सुझावित विषय / क्षेत्र                                                                                                                                                                                                                                                                                                                                 | सुझावित शिक्षण-अधिगम प्रक्रिया                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | सुझावित अधिगम स्रोत                                                                                                                                                                          |
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| <ul style="list-style-type: none"> <li>➤ विभिन्न की परिस्थितियाँ एवं परिवेश का संदर्भ</li> <li>➤ अपने अनुभवों, भावनाओं, विचारों एवं मतों की मौखिक अभिव्यक्ति</li> <li>➤ दूसरों के अनुभव, भावनाओं, विचारों एवं मतों का श्रवण</li> <li>➤ किसी विषय पर स्वतंत्र रूप से बातचीत (कोई त्योहार, टी०वी०, प्रोग्राम, खेल की सामग्री की उपलब्धता आदि)</li> </ul> | <ul style="list-style-type: none"> <li>➤ आस-पास के परिवेश और परिस्थितियों का अवलोकन करने के अवसर दें। बच्चों को प्रश्न पूछने और परिकल्पनाएँ करने के लिए प्रेरित करें।</li> <li>➤ अपने अनुभव, भावनाओं, विचारों और मतों को तार्किक रूप से प्रस्तुत करने के लिए कहें।</li> <li>➤ बोलने और सुनने के शिष्टाचार का कक्षा में पालन करवाएँ। बच्चे उत्साह रुचि और धैर्य से दूसरों के अनुभव, विचारों और मतों को सुनें और समझें।</li> <li>➤ कक्षा में बातचीत का आयोजन करें और बच्चों को उसमें स्वतंत्र रूप से खुल कर हिस्सा लेने और अपने विचार प्रकट करने का अवसर दें तथा</li> </ul> | <ul style="list-style-type: none"> <li>➤ ऑडियो सी०डी०, बाल साहित्य – कहानी, कविता, एकांकी, नाटक, संवाद आदि</li> <li>➤ पहेलियों का संग्रह</li> <li>➤ मुखौटे</li> <li>➤ समाचार पत्र</li> </ul> |

## सुनना और बोलना

| सुझावित विषय / क्षेत्र                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | सुझावित शिक्षण-अधिगम प्रक्रिया                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | सुझावित अधिगम स्रोत |
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| <ul style="list-style-type: none"> <li>➤ बोलने का शिष्टाचार</li> <li>➤ कहानी, कविता पर चर्चा</li> <li>➤ अपने साथियों को मौखिक रूप से दिए गए निर्देश</li> <li>➤ किसी समूह टोली को किसी काम की प्रक्रिया का स्पष्टीकरण</li> <li>➤ सवाल, पहेलियों और समस्याओं को हल करने के अपने तरीकों की मौखिक अभिव्यक्ति</li> <li>➤ मूक अभिनय, एकांकी, नाटक में अभिनय एवं संवाद</li> <li>➤ श्रुतभाव – ग्रहण के लिए विषय-सामग्री</li> <li>➤ 'क्योंकि', 'इसलिए' व 'कैसे' का उपयोग का विवरण</li> <li>➤ अंतर / समानता बताने के लिए 'जबकि' का प्रयोग</li> <li>➤ किसी विषय सामग्री को सुनकर मुख्य बातों की समझ तथा अपने शब्दों में कथन</li> <li>➤ वक्तव्य</li> <li>➤ समाचार</li> <li>➤ साक्षात्कार</li> </ul> | <ul style="list-style-type: none"> <li>प्रोत्साहित करें।</li> <li>➤ किसी गतिविधि या क्रियाकलाप के लिए अपने साथियों को मौखिक रूप से निर्देश देने को कहें और अवलोकन करें कि साथी निर्देशों को सुनकर उनका सही ढंग से पालन कर रहे हैं।</li> <li>➤ बच्चों से पहेलियाँ पूछें और उन्हें बोलने के लिए प्रोत्साहित करें।</li> <li>➤ मूक अभिनय करवाएँ।</li> <li>➤ एकांकी या नाटक का अभिनय करवाएँ। बच्चे पात्रों के मुखौटे भी बना सकते हैं। उन्हें अपनी ओर से संवाद जोड़ने और बोलने को प्रोत्साहित करें।</li> <li>➤ किसी विषय पर दो पात्रों को आपस में काल्पनिक संवाद बनाकर बोलने के लिए प्रोत्साहित करें। जैसे – सड़क पर बैठी दो गायों के बीच संवाद, खंभे और पेड़ के बीच संवाद, बच्चे और उसके पालतू पशु के बीच संवाद आदि।</li> <li>➤ सुनी गई विषय सामग्री के आधार पर बच्चों से क्यों, कैसे आदि वाले प्रश्न पूछें तथा उन्हें कारण बताते हुए तथा विवरण देते हुए उत्तर देने के लिए प्रेरित करें। ध्यान दें कि बच्चे 'क्योंकि', 'इसलिए', 'जबकि' आदि का प्रयोग करते हुए स्पष्ट रूप से उत्तर दें।</li> <li>➤ बच्चों से सुनी गई सामग्री की मुख्य बातों को कक्षा में बोलकर बताने के लिए प्रेरित करें।</li> <li>➤ बच्चों को सुने गए समाचार आपस में साझा करने या एक दूसरे को सुनाने के लिए कहें।</li> <li>➤ विद्यालय के किसी कर्मचारी, पास-पड़ोस के किसी प्रिय या महत्वपूर्ण व्यक्ति से साक्षात्कार और प्राप्त जानकारी को कक्षा में बोलकर सुनाने को प्रेरित करें।</li> <li>➤ सरल विषय पर एक मिनट कक्षा के बच्चों के सामने वक्तव्य देने को कहें।</li> </ul> |                     |

## थीम 2: पढ़ना एवं लिखना (पठन एवं लेखन कौशल)

बच्चे, कहानी, कविता, अनुच्छेद, विवरण, विज्ञापन, संदेश को सही उतार-चढ़ाव तथा विराम-चिह्नों का ध्यान रखते हुए पढ़ते हैं और समझते हैं। चित्र, नक्शा, तालिका आदि को भी पढ़कर समझते हैं। पठित सामग्री के प्रश्नोत्तर, सार, विवरण आदि को अपने शब्दों में लिखते हैं। रचनात्मक लेखन जैसे – अनुच्छेद, निबंध, पत्र, संवाद, कहानी, कविता, चित्र-लेखन आदि करने में रुचि लेते हैं।

### अधिगम उपलब्धियाँ (Learning outcomes):

- ✓ अलग-अलग तरह के लेखन जैसे – कहानी, कविता, नाटक, विवरण, चुटकुले, दोहे, चित्र, रेखाचित्र, निर्देश, नक्शे आदि को समझते हुए उचित प्रवाह व उच्चारण के साथ पढ़ सकेंगे।
- ✓ उच्चरित और लिखित भाषा के बीच के अंतर को समझ सकेंगे।
- ✓ मौन पठन कर सकेंगे।
- ✓ समाचार पत्र आदि में दिए गए विवरण एवं विज्ञापनों को पढ़कर समझ सकेंगे और उस पर चर्चा कर सकेंगे।
- ✓ पाठ्य सामग्री को पढ़ कर समझ सकेंगे और उसके आधार पर प्रश्नों के उत्तर लिख सकेंगे।
- ✓ पाठ्य सामग्री की मुख्य बातों और सार को अपने शब्दों में लिख सकेंगे।
- ✓ कहानी, कविता, विवरण, वस्तु, स्थान, घटना, परिस्थिति, अनुच्छेद को पढ़कर उसके मूल भाव को ग्रहण करेंगे और उस पर चित्र बना सकेंगे।
- ✓ लिखित सामग्री के संदर्भ में आए चित्रों, रेखाचित्रों, छायाचित्रों का अवलोकन करते हुए लिखित सामग्री के साथ उसका संबंध जोड़ सकेंगे।
- ✓ चित्रों के आधार पर रचनात्मक लेखन कर सकेंगे।
- ✓ पढ़ी - सुनी गई कहानियों को नाटक / संवाद के रूप में लिख सकेंगे।
- ✓ आवश्यकता एवं स्थिति के अनुसार औपचारिक एवं अनौपचारिक पत्र, अनुच्छेद, संवाद, कहानी, कविता आदि लिख सकेंगे।

### पढ़ना एवं लिखना

| सुझावित विषय / क्षेत्र                                                                                                                                                                                                                                     | सुझावित शिक्षण-अधिगम प्रक्रिया                                                                                                                                                                                                                                                                                                                                                     | सुझावित अधिगम स्रोत                                                                                                                                                                                                             |
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| <ul style="list-style-type: none"> <li>➤ लेखन के विभिन्न रूपों की समझ</li> <li>➤ कहानी, कविता, अनुच्छेद, विवरण, संदेश, निर्देश व विज्ञापन का पठन</li> <li>➤ मौन पठन एवं सस्वर वाचन</li> <li>➤ पठित सामग्री के आधार पर प्रश्नों के उत्तर का लेखन</li> </ul> | <ul style="list-style-type: none"> <li>➤ स्तार के अनुकूल ऐसा बाल-साहित्य एवं लिखित सामग्री उपलब्ध करवाएँ जिससे बच्चे लेखन के विविध रूपों को पढ़ सकें और पहचान सकें।</li> <li>➤ बच्चों से निर्देशित मौन पठन करवाएँ जिससे उन्हें ध्यानपूर्वक पढ़ने और विशेष जानकारी प्राप्त करने के उद्देश्य से पढ़ने का अभ्यास हो जाए।</li> <li>➤ सही उच्चारण के साथ भावपूर्ण सस्वर वाचन</li> </ul> | <ul style="list-style-type: none"> <li>➤ बाल-साहित्य, ऑडियो, वीडियो, पत्र-पत्रिकाएँ, प्रपत्र, चार्ट, बुलेटिन बोर्ड, वर्ग-पहेली, शब्द-सीढ़ी</li> <li>➤ व्याकरण चार्ट</li> <li>➤ फ़्लैश कार्ड</li> <li>➤ कार्य प्रपत्र</li> </ul> |

## पढ़ना एवं लिखना

| सुझावित विषय / क्षेत्र                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | सुझावित शिक्षण-अधिगम प्रक्रिया                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | सुझावित अधिगम स्रोत |
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| <ul style="list-style-type: none"> <li>▶ पाठ्य सामग्री की मुख्य बातों का रेखांकन एवं अपने शब्दों में लेखन</li> <li>▶ पाठ / अनुच्छेद / विवरण का सार लेखन</li> <li>▶ कहानी, कविता, विवरण, वस्तु, स्थान, घटना परिस्थिति, अनुच्छेद का पठन एवं उसके आधार पर चित्रकारी</li> <li>▶ लिखित निर्देशों का पठन, उसके अनुसार क्रियान्वयन</li> <li>▶ लिखित सामग्री के संदर्भ में आए चित्रों, रेखाचित्रों, छायाचित्रों, का पठन और लिखित सामग्री से उनके जुड़ाव के प्रति समझ</li> <li>▶ अपने अनुभव, विचारों, इच्छाओं, भावना की लिखित अभिव्यक्ति</li> <li>▶ छोटी-छोटी कहानियों का नाट्य रूपांतरण लिखित रूप में</li> <li>▶ अपने और दूसरों के अनुभवों की लिखित में तुलना</li> </ul> <p><b>संदर्भ में व्याकरण</b></p> <ul style="list-style-type: none"> <li>▶ संज्ञा, सर्वनाम, विशेषण, क्रिया-भेद सहित</li> <li>▶ पाठ्य-सामग्री में प्रयुक्त उपसर्ग / प्रत्यय वाले शब्द</li> </ul> | <p>करवाएँ।</p> <ul style="list-style-type: none"> <li>▶ पठन सामग्री के आधार पर प्रश्नों पर चर्चा करें और लिखने के लिए प्रेरित करें।</li> <li>▶ बच्चों से पढ़ी गई सामग्री का केंद्रीय भाव और सार लिखवाएँ।</li> <li>▶ पठित सामग्री के आधार पर बच्चों से चित्र बनाने को कहें।</li> <li>▶ लिखे गए निर्देशों को पढ़वाएँ और देखें कि बच्चे निर्देशानुसार कार्य कर रहे हैं।</li> <li>▶ इस बात पर ध्यान दें कि पाठ में आए चित्रों / छायाचित्रों के साथ लिखित सामग्री का संबंध जोड़ सकें।</li> <li>▶ घर, खेल का मैदान, कक्षा, बाज़ार, बस आदि से जुड़े अपने अनुभवों को लिखें और एक-दूसरे से साझा करें।</li> <li>▶ कहानियों का नाट्य रूपांतरण कर उसका अभिनय करने को कहें।</li> <li>▶ समाचार पत्र और पत्रिकाओं से लेख और विवरण पढ़ने के लिए कहें।</li> <li>▶ पठन सामग्री में से संज्ञा, सर्वनाम, विशेषण और क्रिया के भेदों की पहचान करवाएँ।</li> <li>▶ उपसर्ग-प्रत्यय वाले शब्दों को चुनकर मूल शब्द और उपसर्ग / प्रत्यय की पहचान करवाएँ, जैसे –</li> </ul> <p><b>उपसर्ग शब्द</b></p> <ul style="list-style-type: none"> <li>☛ विजय = वि जय</li> <li>☛ अजय = अ जय</li> </ul> <p><b>प्रत्यय शब्द</b></p> <ul style="list-style-type: none"> <li>☛ समानता = समान ता</li> <li>☛ भारतीय = भारत ईय</li> </ul> <ul style="list-style-type: none"> <li>▶ पाठ्य-सामग्री कुछ सामासिक शब्द चुनकर अभ्यास करवाएँ।</li> </ul> <ul style="list-style-type: none"> <li>☛ राष्ट्रपति = राष्ट्र + पति</li> <li>☛ विद्यालय = विद्या + आलय</li> </ul> |                     |

## पढ़ना एवं लिखना

| सुझावित विषय / क्षेत्र                                                                                                                                                                                                                                                                                                                                                                                                  | सुझावित शिक्षण-अधिगम प्रक्रिया                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | सुझावित अधिगम स्रोत |
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| <ul style="list-style-type: none"> <li>➤ पाठ्य-सामग्री में प्रयुक्त सामासिक शब्द</li> <li>➤ अनुस्वार और अनुनासिक</li> <li>➤ परसर्गों का प्रयोग</li> <li>➤ काल</li> <li>➤ योजकों का प्रयोग</li> <li>➤ विराम-चिह्न</li> <li>➤ मुहावरे<br/>रचनात्मक लेखन</li> <li>➤ निबंध</li> <li>➤ पत्र-लेखन</li> <li>➤ संवाद-लेखन</li> <li>➤ कहानी लेखन</li> <li>➤ चित्र-लेखन</li> <li>➤ कविता-लेखन</li> <li>➤ अपठित-गद्यांश</li> </ul> | <ul style="list-style-type: none"> <li>➤ अनुस्वार और अनुनासिक के प्रयोग वाले शब्द छटवाएँ और उनमें अंतर स्पष्ट करें।</li> <li>➤ परसर्गों की समझ और प्रयोग के लिए अभ्यास करवाएँ। पठन और लेखन में उचित विराम-चिह्नों के प्रयोग पर ध्यान दिलवाएँ, जैसे – रुको, मत जाओ। रुको मत, जाओ।</li> <li>➤ पाठ्य-सामग्री में प्रयुक्त मुहावरों का उचित संदर्भों में वाक्य प्रयोग करवाएँ।</li> <li>➤ निबंध लेखन के लिए बच्चों के परिवेश से जुड़े विषयों पर निबंध लिखने को कहें।</li> <li>➤ औपचारिक और अनौपचारिक पत्रों का प्रारूप स्पष्ट करके विषय देकर पत्र लेखन करवाएँ।</li> <li>➤ बच्चों को संवाद, कविता, कहानी और चित्र लेखन करने के लिए प्रोत्साहित करें।</li> <li>➤ बच्चों के कार्य को बुलेटिन बोर्ड पर प्रदर्शित करें।</li> </ul> |                     |

*MATHEMATICS*

## Theme 1: Numbers

Children will be enabled to understand how the place value system works thereby helping them to think about the size of large numbers that they have not counted. Estimation is an essential skill that demonstrates number sense about base 10 system. Activities based on items such as beans or marbles help children develop strategies for estimating quantities. Numerals are written in both compact form and expanded form is used in algorithms. Rounding is a skill to estimation that requires understanding of a relationship between numbers. Opportunities will be provided to facilitate children's use of the place value frame and place value chart to represent large numbers. They will learn to express numbers in many ways like with words (number names), numerals and words, numerals only and finally develop scientific or exponential notations for large numbers in higher classes.

### Learning Outcomes:

Children will be able to:

- ✓ read and write large numbers up to crores using the Indian numeration system;
- ✓ compare the Indian numeration system with the International system and read, write numbers using International numeration system;
- ✓ use place value to write a number in expanded form and vice versa;
- ✓ compare large numbers using place value;
- ✓ use place value to form greatest and smallest numbers from the given digits;
- ✓ round off numbers to nearest 10s, 100s or 1000<sup>th</sup>;
- ✓ represent numbers using roman symbols;
- ✓ acquire understanding about fractions;
- ✓ find the fractional part of a collection;
- ✓ identify and form equivalent fractions of a given fraction;
- ✓ express a given fraction  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$  in decimal notation and vice-versa. For example, in using units of length and money - ₹ 5 is half of ₹ 10.

| Numbers                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Concepts                                                                                                                                                                                                                                                                                                                                                | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                             | Suggested Learning Resources                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>➤ Indian and International system of numbers- 9 digits numbers.</li> <li>➤ Place value and face value.</li> <li>➤ Expanded form.</li> <li>➤ Comparison of the numbers.</li> <li>➤ Ascending and descending order of numbers.</li> <li>➤ Formation of greatest and smallest numbers from the given digits.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Collecting and discussing various contexts in which large numbers are used like cost of properties, distance between planets etc.</li> <li>➤ Involving children in collecting information from newspapers and magazines having large numbers should be encouraged to write the equivalent</li> </ul> | <ul style="list-style-type: none"> <li>➤ 9 Sets of number cards from 0-9 to create large numbers.</li> <li>➤ New papers and magazine cutting having references of large numbers.</li> <li>➤ Spike abacus with 9 spikes to represent numbers up to 9-digits.</li> </ul> |



## Numbers

| Key Concepts                                                                                                                                                                                                                                                                                                        | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Suggested Learning Resources |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <ul style="list-style-type: none"> <li>➤ Rounding off numbers- nearest 10, 100, 1000.</li> <li>➤ Construction of Multiplication Tables - 2 to 20.</li> <li>➤ Addition, Subtraction, Multiplication, Division by 2-digit division.</li> <li>➤ Word problems.</li> <li>➤ Roman numerals for large numbers.</li> </ul> | <ul style="list-style-type: none"> <li>Indian/International number system.</li> <li>➤ Practicing place value and its understanding through games/activities and concrete materials.</li> <li>➤ Encouraging children to form rules for comparison of large number through exploration/patterns.</li> <li>➤ Using newspapers and other reports to show how approximation of numbers is used in day to day life. Children should also be encouraged to discover rules of rounding off/approximation.</li> </ul> |                              |

## Theme 2: Number Operations

The confidence gained in using standard algorithms for operations on whole numbers leads children to use them efficiently for problem solving and in addition, subtraction, multiplication and division of common fractions, decimal fractions and integers in later classes. Using manipulatives like place-value charts, unifix cubes and base ten blocks, 10X10 number grid and number line strengthens the understanding of standard algorithms. In using manipulatives in this context, children can be encouraged to work in pairs, one working with the models and the other recording the steps. It is important that children record the steps as they model them.

### Learning Outcomes:

Children will be able to:

- ✎ apply the understanding of place value of numbers beyond 1000 in the four operations;
- ✎ divide a given number by another number (up to two digits);
- ✎ estimate sum, difference, product and quotient of numbers and verifies the same;
- ✎ use standard algorithms in addition subtraction and multiplication of numbers;
- ✎ divide a given number by another number (up to 2 digits) by using standard algorithm;
- ✎ solve problems involving four operations addition, subtraction, multiplication and division in different real life contexts;
- ✎ frame word problems based on mathematical statements involving number operations;
- ✎ explain the meaning of factors, multiples prime and composite numbers;
- ✎ find and displays multiples and factors of numbers using various techniques (e.g. factor tree);
- ✎ discover prime & composite number in the number sequence up to 100.

| Number Operations                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                           |
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| Key Concepts                                                                                                                                                                                                                                                                                                                                                                                | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Suggested Learning Resources                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>➤ Standard algorithms for addition subtraction and multiplication of large numbers.</li> <li>➤ Division of given number by another number (up to 2 digits).</li> <li>➤ Framing and solving Problem from real life contexts involving number operations.</li> <li>➤ Estimation of the sum, difference, product and quotient of two or more</li> </ul> | <ul style="list-style-type: none"> <li>➤ Exploring alternate algorithms for all four operations in addition to standard algorithms.</li> <li>➤ Dividing numbers using different strategies like using standard algorithms or breaking a number and then using operation. (For example, to divide 9450 by 25, divide 9000 by 25, 400 by 25, and finally 50 by 25 to obtain the answer by adding all these quotients).</li> <li>➤ Providing opportunities to explore the meaning of factors.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Number cards and place value cards. (These will be used to demonstrate various algorithms for operations on numbers).</li> <li>➤ Play money notes and coins (for representation of numbers according to place value).</li> </ul> |

| Number Operations |                                                                                                                                                                                                                                                                                                                                               |                              |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Key Concepts      | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                             | Suggested Learning Resources |
| numbers.          | <ul style="list-style-type: none"> <li>➤ Creating contextual problems (within the child's daily life context) as word stories and exchange them with peers to solve.</li> <li>➤ Providing opportunities for children to frame rules for estimation of the net result of four operations applied on numbers in daily life contexts.</li> </ul> |                              |

**Life Skills:** solving daily life problems

### Theme 3: Fractions and Decimals

Children's comprehension of whole numbers and common fractions forms the basis for their understanding of decimal fractions. Real-world examples of things separated into tenths and hundredths are less common than are examples of common fractions. A better understanding will be developed through metric sub units like Deci (one-tenth), centi (one-hundredth), milli (one-thousandth) etc. An understanding of decimal fractions and their relationship with common fractions develops gradually, thus the focus will be on work with physical material, diagrams and real life situations.

#### Learning Outcomes:

Children will be able to:

- ✓ define proper, improper and mixed fractions;
- ✓ write equivalent fractions of given fraction by multiplying/dividing numerator and denominator;
- ✓ compare 3 or more fractions;
- ✓ add and subtract unlike fractions and mixed numbers;
- ✓ solve word problems on addition and subtraction of fractions;
- ✓ explain multiplication of fraction as 'of';
- ✓ multiply fractions- fraction by a whole number, fraction by fraction;
- ✓ relate fractions with denominator 10, 100, 1000 as decimal fraction;
- ✓ represent decimal fractions pictorially;
- ✓ find place value of decimal fractions as -tenths, hundredths, thousandths etc.;
- ✓ expand decimal fractions e.g.  $234.67 = 200 + 30 + 4 + \frac{6}{10} + \frac{7}{100}$ ;
- ✓ classify decimal fractions as equivalent, like, and unlike;
- ✓ compare and order decimal fractions;
- ✓ add and subtract decimal fractions;
- ✓ solve word problems on addition and subtraction of decimal numbers;
- ✓ construct rules to multiply decimal fraction by 10, 100, 1000;
- ✓ multiply decimal number by whole number and decimal number by decimal number.

## Fractions and Decimals

| Key Concepts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Suggested Learning Resources                                                                                                                                                                                                                                                   |
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| <ul style="list-style-type: none"> <li>➤ Comparison of 3 or more fractions.</li> <li>➤ Addition and subtraction of unlike fractions.</li> <li>➤ Addition and subtraction of mixed numbers.</li> <li>➤ Word problems on addition and subtraction of fractions.</li> <li>➤ Multiplication of fractions- fraction by whole numbers and fraction and fraction.</li> <li>➤ Division of fractions- whole number by a fraction, fraction by a fraction.</li> <li>➤ Relationship between fractions and Decimals fraction.</li> <li>➤ Pictorial representation of decimal fraction.</li> <li>➤ Place value of decimal fraction- tenths, hundredths, thousandths.</li> <li>➤ Expanded form: Decimal and fraction expansion</li> <li>➤ Types of decimal fractions- equivalent, like, and unlike</li> <li>➤ Comparing decimal fractions.</li> <li>➤ Ordering of decimal fraction</li> <li>➤ Addition and subtraction of decimal fraction.</li> <li>➤ Word problems on addition and subtraction of decimal fraction.</li> <li>➤ Multiplication of decimal fractions by 10, 100, 1000.</li> <li>➤ Multiplication of decimal number by whole number and decimal number by decimal number.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using Paper folding to demonstrate like-unlike fractions, addition and subtraction of fractions and equivalent fractions.</li> <li>➤ Encouraging children using origami paper for folding into equal number of parts to show fractions and their operations.</li> <li>➤ Conducting activities for multiplication of fraction by another fraction as operation “of” through paper folding, coloring and forming rules.<br/>For example, <math>\frac{1}{2} \times \frac{1}{3}</math> is half of one – third</li> <li>➤ Associating the idea of division of fractions with division of whole numbers as number of times the divisor lies in the dividend. For example, <math>\frac{1}{2} \div \frac{1}{4}</math> means number of <math>\frac{1}{4}</math> in <math>\frac{1}{2}</math> which is nothing but 2.</li> <li>➤ Introducing through demonstration -decimal fractions as fraction with 10, 100, 1000 etc. as denominators and discussing the ways in which such numbers can be written using place value system.</li> <li>➤ Involving children in framing rules to operate decimal fractions using the rules used for operating fractions.</li> <li>➤ Measuring tape and scale can be used to demonstrate fractions, decimals and their relationship.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Origami paper (<i>for showing fractions and their operations by folding in to equal number of parts</i>).</li> <li>➤ Bending wire.</li> <li>➤ Wooden sticks.</li> <li>➤ Number cards.</li> <li>➤ Measuring tape and scale.</li> </ul> |

## Theme 4: Playing with Numbers (Factors and Multiples)

There are many relationships in the Numbers system which include even and odd numbers, prime and composite numbers. The classification of numbers into two groups is made on the basis of some properties of the numbers. Factors are one of such properties. Work with prime and composite numbers extends understanding of factors, divisors and multiples encountered in the study of multiplication and division. Children should learn that factors and division mean the same thing and that they can be used interchangeably. When two whole numbers are multiplied they should yield a product and can be called either factors or divisors of their product (exceptionally zero can be a factor but not a divisor). The product of two numbers also called multiple of the two numbers is another concept that is directly related with multiplication of numbers. The children then can adopt any of the two ways of finding factors of numbers; determining by examination and the second more systematic way is using factor trees. children must be advised to use the examination method to factor numbers and to name the greatest of them as HCF. Likewise they should adopt their own ways to find and name the smallest multiple of two or numbers as their LCM.

### Learning Outcomes:

Children will be able to:

- ✎ write multiples of numbers;
- ✎ find factors of numbers;
- ✎ identify prime and composite numbers, twin primes and co-prime numbers;
- ✎ test divisibility of numbers by 2, 3, 4 and 5;
- ✎ find prime factors- by Factor Tree;
- ✎ find the Highest Common Factor (HCF)- Listing Method and Common Division;
- ✎ find the Lowest Common Multiples (LCM)- Listing Method and Common division;
- ✎ relate HCF and LCM and uses to find one when other is given.

### Factors and Multiples

| Key Concepts                                                                                                                                                                                                                                                                                                                                                                    | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                  | Suggested Learning Resources                                                                                                                                                                                                                                                |
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| <ul style="list-style-type: none"> <li>➤ Factors, common factors and Highest common factors of two numbers.</li> <li>➤ Multiples, common multiples and Lowest Common multiples of two numbers.</li> <li>➤ Prime and composite numbers, Twin primes and co-prime.</li> <li>➤ Prime factors- Factor Tree Method.</li> <li>➤ Highest Common Factor(HCF)- Listing Method</li> </ul> | <ul style="list-style-type: none"> <li>➤ Exploring counting numbers for multiples of numbers through various strategies like multiplication tables, number line, skipping the number etc.</li> <li>➤ Using various strategies by children monitored by the teacher to find factors of a number.</li> <li>➤ Involving children in finding and displaying</li> </ul> | <ul style="list-style-type: none"> <li>➤ Set of counters. (so that children can make equal groups to understand factors like, 24 counters can be grouped equally in to 24, 12, 8, 6, 4, 3, 2 and 1 groups)</li> <li>➤ Wooden sticks of same and different sizes.</li> </ul> |

## Factors and Multiples

| Key Concepts                                                                                                                                                                                                                             | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                            | Suggested Learning Resources |
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| <p>and Common Division.</p> <p>➤ Lowest Common Multiples(LCM)- Listing Method and Common Division.</p> <p>➤ Relationship between HCF and LCM.</p> <p>➤ Test for divisibility by 2, 3, 4, 5, 9 10, 11 (forming rules by observation).</p> | <p>multiples and factors of numbers using various techniques (e.g. <i>factor tree</i>, <i>multiplication tables</i>, <i>skip counting on a number line etc.</i>)</p> <p>➤ Encouraging children to find prime numbers based on factors. Discussion may be held with them focusing on why prime numbers are important and useful.</p> <p>➤ Involving children in discovering prime and composite numbers in the number sequence up to 100.</p> |                              |

## Theme 5: Introduction to Negative Numbers

The concept of a number having a value of less than zero and number indicating a direction are not easily understandable through words alone. In this theme children through situations will be exposed to involving negative and positive number (integers). This will enable children to visualize and understand them better. Number line helps children understand moving up and down the number sequence, magnitude of numbers and the concepts of more than and less than. When used to compare numbers, children see that any number is greater than any other number to its left. The same property holds for negative numbers too. When integers are ordered on a number line, as negatives number get larger their value get smaller and smaller.

### Learning Outcomes:

Children will be able to:

-  represent whole numbers through number line;
-  develop idea of integers as counting number, zero and negatives of counting numbers;
-  compare integers through number line;
-  arrange integers in ascending and descending order;
-  add and subtract integers.

### Introduction to negative numbers

| Key Concepts                                                                                                                                                                                                                                                                                                                                                           | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Suggested Learning Resources                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>➤ Introduction to negative numbers through number line.</li> <li>➤ Idea of integers as counting number, zero and negatives of counting numbers.</li> <li>➤ Comparison of integers through number line.</li> <li>➤ Ascending and Descending order of integer.</li> <li>➤ Rules for addition, subtraction of integers.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Involving children in discussion to have necessity of numbers less than zero like having measurement in opposite directions with reference to a point (<i>above and below sea level, temperature above and below zero etc.</i>)</li> <li>➤ Encouraging children to use number line for representation of negative numbers.</li> <li>➤ Letting children explore the ways to name negative and positive numbers together along with zero.</li> <li>➤ Using number line to show that negative numbers are mirror image points corresponding to counting numbers (<i>natural numbers</i>)</li> <li>➤ Number line may be used to represent integers and their ascending and descending orders.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Number line.</li> <li>➤ Counters of two colours where the colours represent opposite numbers.</li> </ul> |



## Theme 6: Geometry

The levels described by the Van Hiele are sequential, and success at one level depends on the development of geometric thinking at the preceding level. Typically, children at the primary level demonstrate characteristics of level 0 and are moving toward level 1 of the Van Hiele's levels of geometric thought. Children entering the class V are most likely functioning in the visualization and analysis levels (0 and 1) of geometric thought. The goal of teaching geometry at this stage is to provide instructional activities that will encourage children to develop thinking and reasoning skills needed to move towards level 2 of the hierarchy, informal deduction (at upper primary stage). Building on children's experiences with non-standard to standard measures they are ready to begin work with acquiring a confidence in using standard units and relate bigger to smaller and vice-versa.

### Learning Outcomes:

Children will be able to:

-  explore idea of angles and shapes;
-  classify angles into right angle, acute angle, obtuse angle and represents the same by drawing and tracing;
-  identify 2D shapes from the immediate environment that have rotation and reflection symmetry like alphabet and shapes;
-  identify angles in the environment through observation and paper folding;
-  identify rights angles in the objects and in the environment;
-  classify angles into right, acute, obtuse angles based on their visible attributes;
-  represent different angles (like acute, obtuse, right angles) by drawing and tracing on the paper;
-  explore symmetry in familiar 3D shapes;
-  explore reflection symmetry and rotational symmetry w.r.t. to familiar 2D- geometrical shapes;
-  construct the shapes of cubes, cuboids, cylinders and cones from the given nets (designed for this purpose).

| Geometry                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Concepts                                                                                                                                                                                                                                                         | Suggested Transactional Processes                                                                                                                                                                                                                                                        | Suggested Learning Resources                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>➤ Angle and its measures.</li> <li>➤ Classification of angles into right, acute, obtuse angles.</li> <li>➤ Identification and representation of acute, obtuse and right angles.</li> <li>➤ Symmetry in familiar 3D</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using paper folding activities (fold art angle) right angles can be identified in the vicinity and in objects.</li> <li>➤ Buildings, class room door windows etc. can provide excellent concrete support to the concept of an angle.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Coloured papers, cardboards, scissors, etc.</li> <li>➤ Small pieces of mirrors with rounded edge.</li> <li>➤ Empty card board boxes.</li> <li>➤ Thick card board sheets, pencils, markers and cutters.</li> </ul> |

| Geometry                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Key Concepts                                                                                                                                                                                                                                  | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Suggested Learning Resources |
| <p>shapes like Cube, human body, buildings etc.</p> <p>➤ Reflection and rotational symmetry in familiar 2D-geometrical shapes like circle, rectangle, square, triangle and circles.</p> <p>➤ Nets of cubes, cuboids, cylinders and cones.</p> | <p>➤ Classification of angles may be encouraged by finding obtuse and acute angles in surroundings and in the objects around us.</p> <p>➤ Discovering symmetry in the objects/environment may be encouraged.</p> <p>➤ Using concrete materials to explore reflective as well as rotational symmetry. Card board cut out shapes, may be rotated from different points to find out their rotational symmetry. Paper folding, making shapes/designs using carbon papers etc. may be used for developing a deeper understanding of concept of the symmetry.</p> <p>➤ Encouraging children to bring empty boxes, open them up and trace their nets. Also using the nets so traced are able to create boxes.</p> |                              |

**Integration:** Science (Solids, Liquids and Gases)

## Theme 7: Measurement

The early learning of measurement is largely inventive and investigative by nature. Children up to primary grades begin with activities to establish the everyday contexts for measurement and to introduce measurement with nonstandard units. This theme will enable children to begin to conserve length and area and understand that these concepts do not change, even when an object's position or appearance is altered. Children will also learn to use standard units by providing them frequent opportunities to measure objects so that they construct their understanding of units and of the measurement process.

### Learning Outcomes:

Children will be able to:

- ✎ relate different commonly used larger and smaller units of length, weight, time and money and convert larger units to smaller units and vice versa;
- ✎ estimate the volume of a solid body in known units like volume of a bucket in about 20 times that of a mug;
- ✎ apply the four operations in solving problems involving money, length, mass, capacity and time intervals;
- ✎ explain the terms area and perimeter of simple geometrical shapes;
- ✎ compute area and perimeter of simple geometrical shapes.

| Measurement                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Concepts                                                                                                                                                                                                                                                                                                                                                 | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Suggested Learning Resources                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>➤ Area and perimeter of simple geometrical shapes; ideas and their measurement.</li> <li>➤ Daily life problems involving length, weight, time, money &amp; volume: Use of four number operations.</li> <li>➤ Idea of larger and smaller units of length, weight, time, money &amp; volume and conversion .</li> </ul> | <ul style="list-style-type: none"> <li>➤ Developing and using Square grids, dot grid to facilitate the understanding of concepts related to area and perimeter.</li> <li>➤ Conducting exploration activities with groups of children to infer that area and perimeter are not co-related i.e. figures having same area may have different perimeters.</li> <li>➤ Creating and solving contextual problems regarding calculations of length, weight, volume etc.</li> <li>➤ Providing practice questions for inter conversion of bigger units into smaller units and vice versa in various interesting ways.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Squared grid papers, dot grid printed papers.</li> <li>➤ Coloured markers, scissors etc.</li> <li>➤ Daily life objects such as match boxes, sugar cubes, paper weight, etc. (<i>for demonstration of length, area, volume and weight</i>).</li> </ul> |

**Integration:** Science

**Life Skills:** solving daily life problems

## Theme 8: Introduction to Percentage

This theme will focus on children becoming aware and understanding the importance use and different applications of percentage in a variety of ways in many daily life aspects. Percent expresses a relationship between some number and 100. The symbol % and word percent means per hundred or out of hundred. The children at this stage will be provided opportunities to understand the meaning of percent through their experiences. As percent is common fraction with 100 as denominator, so it is also a decimal fraction representing hundredths. A conscious attempt will be made to extensively build on children's understanding about these earlier learnt concepts to further build their understanding about percent.

### Learning Outcomes:

Children will be able to:

-  define percentages as fraction with 100 as denominator;
-  establish relationship between fractions, decimal fractions and percentages;
-  pictorially represent percentage;
-  convert fractions to percentages and vice-versa;
-  convert decimals to percentages and vice-versa;
-  solve simple word problem on percentage.

| Introduction to Percentage                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Concepts                                                                                                                                                                                                                                                                                                                                                                                                  | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                        | Suggested Learning Resources                                                                                                                   |
| <ul style="list-style-type: none"><li>➤ Introduction of percentages.</li><li>➤ Relationship between fractions, decimals and percentage.</li><li>➤ Pictorial representation of percentage.</li><li>➤ Conversion of fractions to percentages and percentages to Fractions.</li><li>➤ Conversion of decimals to percentages and percentages to decimals.</li><li>➤ Simple word problems on percentage.</li></ul> | <ul style="list-style-type: none"><li>➤ Introducing percentage as fraction with denominator as 100 and relating it with decimal representation.</li><li>➤ Letting children form the rules for percentage and conversion using the known rules of fractional and decimals.</li><li>➤ Encouraging children to relate their marks obtained in different subject with percentage.</li><li>➤ Measuring tapes, scales may be used to explain fractions and decimals.</li></ul> | <ul style="list-style-type: none"><li>➤ Measuring tape.</li><li>➤ Scale.</li><li>➤ Number sticks.</li><li>➤ Paper magazine cuttings.</li></ul> |

**Life Skills:** solving daily life problems

## Theme 9: Data Handling

Various graphs like pie charts, line graphs and bar graphs relate to children's daily life experiences like newspapers and sports transmission shown on TV. Children will be encouraged to devise their own ways of reading and interpreting these pictographs. At this stage children are skilled to attempt the drawing of bar graphs for the data either collected by them or obtained from other sources. The data related to issues related to environment, classroom activities etc. will help children in connecting the skill of data handling with their daily activities.

### Learning Outcomes:

Children will be able to:

- collect data related to various daily life situations, represents it in tabular form and by bar graphs and interpret a given bar graph.
- interpret pie charts and line graphs generally found in newspapers and magazines.

| Data Handling                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Concepts                                                                                                                                             | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Suggested Learning Resources                                                                                                                                                                         |
| <ul style="list-style-type: none"><li>Pictorial representation of the raw data.</li><li>Interpretation of Bar graph, line graph and pie chart.</li></ul> | <ul style="list-style-type: none"><li>Conducting group activities on data collection, tabulation (in graphic form) and interpretation within and outside classrooms.</li><li>Advising children to make presentation as groups on their whole activity as a project. This should have tabular and graphical representations as used in newspaper/magazines</li><li>Providing opportunities to interpret pie charts and line graphs given in textbooks, newspaper and magazine cuttings.</li></ul> | <ul style="list-style-type: none"><li>Coloured papers, stickers of different objects, glue sticks.</li><li>Newspaper and magazines cuttings having bar graphs, pie charts and line graphs.</li></ul> |

**Integration:** Arts Education

**Life Skills:** analysis and interpretation

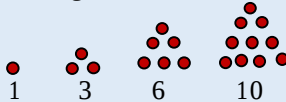
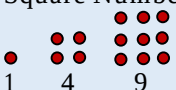
## Theme 10: Patterns

Children are now confident at this stage with observing and generalizing patterns in numbers and shapes. This will help them in other themes of mathematics like applying operations on numbers (whole numbers, common and decimal fractions), properties of various 2-D shapes and 3-D figures and measurements. They should explore additional properties of whole numbers like triangular and square numbers through patterns.

### Learning Outcomes:

Children will be able to:

-  observe and identify patterns with a unit of repeat and extend it;
-  observe and generalize a rule to extend a progressive pattern;
-  create a pattern with more than one characteristic;
-  observe and generalize patterns of triangular and square numbers.

| Patterns                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Concepts                                                                                                                                                                                                                                                                            | Suggested Transactional Processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Suggested Learning Resources                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>➤ Patterns with a unit of repeat and their extension.</li> <li>➤ Progressive patterns.</li> <li>➤ Extension of progressive patterns.</li> <li>➤ Patterns with more than one characteristic.</li> <li>➤ Triangular and square numbers.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Providing a lot of patterns that are in the near vicinity of children and have a unit of repeat. Let them identify this unit and extend the pattern.</li> <li>➤ Dividing children in to group of two-three each. Let one group form a pattern with repeat and other extend it.</li> <li>➤ Giving exposure to progressive patterns which are commonly found in numbers and shapes. For example:</li> </ul> <p>2, 4, 6, .....; 5, 10, 15, 20, .....</p> <p>.....    </p> <ul style="list-style-type: none"> <li>➤ Providing opportunities for finding a rule for extension of the pattern of numbers that can be placed as triangle and square. Let children find further few terms on the basis of the rule and without finding all previous terms.</li> <li>➤ Triangular numbers</li> </ul> <div style="text-align: center;">  </div> <p>1      3      6      10</p> <p>Square Numbers</p> <div style="text-align: center;">  </div> <p>1      4      9</p> | <ul style="list-style-type: none"> <li>➤ Number sticks.</li> <li>➤ Triangular, square, rectangular shapes made from thick paper cutter.</li> <li>➤ Use of charts showing patterns with numbers, and different shapes.</li> </ul> |

**Integration:** Arts Education

**Life Skill:** Logical thinking, reasoning