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Students learn to sound out words by their beginning, middle and ending sounds. They start their phonics journey by learning the initial sounds. These worksheets help your kids learn to recognize the sounds letters make at the beginning of words. Showing all 17 resultsSorted by latest The letters A, E, I, O and U are vowels. These phonics worksheets introduce students to short and long vowels, vowel blends, r-controlled vowels and digraphs. Writing vowel blends is harder for students as not only do they need to recognize the blend sound, but also know the two letters that together make that sound (e.g. 'ea' makes the 'ee' sound). In these vowel blend sound worksheets, students write the missing letters (a vowel blend) for each pictured word. The goal is instant recognition of the sounds of the various vowel blends. Designed by Chris Phonics involves teaching and learning the skill of reading by focusing on the relationship between sounds and letter formations. This collection of free phonics worksheets contains 11 sets of common phonics activities, graduated by ability level. Each set contains multiple different pages to cover all possible combinations required for learning phonics at school or home! The phonics concepts covered are listed below: CVC Set (20 Pages) – CVC words are words that contain a consonant, vowel, then consonant, such as “dog”. CVCE Set (9 Pages) – CVCE words have a ‘silent e’ at the end, which causes the preceding vowel to be sounded out as a long vowel. Short Vowel Set (16 Pages) – Short vowel words are words where the vowel is sounded-out in its short form, such as “hat”. Long Vowel Set (8 Pages) – Long vowel words are words where the vowel is sounded-out in its long form, such as “cake”. Magic E Set (13 Pages) – The magic e turns a short vowel into a long vowel, such as “cap” vs “cape”. Consonant Blends (22 Pages) – Consonant blends are sets of consonants that pair with one another to make a blended sound, such as “gr” and “bl”. Note that you hear both letters distinctly when sounded out, unlike digraphs. Digraphs Set (53 Pages) – Digraphs are sets of letters that pair together to make one sound, such as “th” and “sh”. R-Controlled Vowels Set (58 Pages) – This set contains words where the vowel immediately precedes an ‘r’, such as ‘or’ and ‘er’. In these instances, the vowel is blended with the r, with the result that it neither makes a long nor short vowel sound. Word Families Set (100 Pages) – Word families are groups of words that share common base patterns, such as “at” in cat, hat, rat, and sat. Prefixes Set (10 Pages) – Prefixes are added to the beginning of a stem word to affect its meaning of usage, as in “unsettled”. Suffixes Set (10 Pages) – Suffixes are added to the end of a stem word to affects its meaning or usage, as in “colorful”. Root Words Set (8 Pages) – Root words are the words we can identify before suffixes or prefixes are added. All the worksheets are designed to be printed onto regular US Letterhead paper (the sort of paper you’d put into your at-home printer!). Make sure you select the “shrink to fit” option when printing to avoid any cut-offs on your print. License and Terms of Use: All printables are provided for non-commercial personal and classroom use only, not for resale or distribution. All rights reserved. Designed by Chris CVC words are words that contain a consonant, vowel, then consonant, such as “dog”. Designed by Chris CVCE words have a ‘silent e’ at the end, which causes the preceding vowel to be sounded out as a long vowel. Designed by Chris Short vowel words are words where the vowel is sounded-out in its short form, such as “hat”. Designed by Chris Long vowel words are words where the vowel is sounded-out in its long form, such as “cake”. Designed by Chris The magic e turns a short vowel into a long vowel, such as “cap” vs “cape”. Designed by Chris Consonant blends are sets of consonants that pair with one another to make a blended sound, such as “gr” and “bl”. Note that you hear both letters distinctly when sounded out, unlike digraphs. Designed by Chris Digraphs are sets of letters that pair together to make one sound, such as “th” and “sh”. Designed by Chris This set contains words where the vowel immediately precedes an ‘r’, such as ‘or’ and ‘er’. In these instances, the vowel is blended with the r, with the result that it neither makes a long nor short vowel sound. Designed by Chris Word families are groups of words that share common base patterns, such as “at” in cat, hat, rat, and sat. Designed by Chris Prefixes are added to the beginning of a stem word to affect its meaning of usage, as in “unsettled”. Designed by Chris Suffixes are added to the end of a stem word to affects its meaning or usage, as in “colorful”. Designed by Chris Root words are the words we can identify before suffixes or prefixes are added. Vowels help us to make words. A, E, I, O, and U are called vowels. The rest of the letters of the alphabet are called consonants. There are very few words in English without vowels in them. They can be categorized into short-vowel and long-vowel. Check out the worksheets below to practice. Worksheets Colour the Letters In the above worksheet, some letters are given. The kid has to find and color the letters a, e, i, o, u in blue and consonants in red. READ MORE: English Alphabet Practice | Free Worksheets Find and Circle In the above worksheet, some letters are given. The kid has to circle the letters a, e, i, o, and u In the above worksheet twinkle, twinkle little star rhymes are given. The kid has to find and circle the vowels. From this worksheet, the kid can identify the vowels from the words. In the above worksheets, three-letter words are given. The kid has to find and circle the vowels in each word. Find the Short Vowels Short vowels are pronounced with a short sound. For example, in the word CAT, the vowel A is pronounced with a short sound. In the above worksheets, the kid has to identify the picture and write the correct vowel letter. Download Worksheets > Check out our other worksheets and activities for kindergarten: PLEASE LIKE AND FOLLOW ME ON FACEBOOK AND INSTAGRAM PRACTICE MAKES YOU TO EXCELLENT KEEP PRACTICING Math Reading Kindergarten Vocabulary Spelling Spelling by Grade Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Grammar & Writing Science Science by Grade Kindergarten Grade 1 Grade 2 Grade 3 Cursive | Bookstore It is important that students are taught early on that letters can have more than one sound…. it’s just the nature of the English language. However, learning about vowels and their sounds can be a bit confusing for kindergarteners. Take time to teach the vowels and the consonants first, then bring in the letter sounds. When teaching the letter sounds be sure to explain that vowels have a short sound, and a long sound. An easy way to remember which is which, is that long vowel sounds get to say their name. So, for example, long A says “AY” and long E says “EE” etc… Spin Read and BUMP Games Spin, Read, and BUMP will have your students giggling while they learn key vowel team words! This game is super fun and can be played as single player or multi-player with just a few adaptations. Find more Vowel Printables Here: The distinction between vowels and consonants lies at the very heart of phonics and early literacy education. Understanding and mastering this fundamental concept is essential for young learners as it forms the basis for decoding words, spelling correctly, and developing overall language skills. To empower students with the foundational knowledge needed to navigate the world of letters and sounds, we proudly present a collection of 15 worksheets titled “Vowels vs. Consonants.” These worksheets are meticulously designed to provide students with structured and engaging opportunities to grasp the crucial difference between vowels and consonants. What are Vowels vs. Consonants Worksheets? Vowels vs. Consonants Worksheets are educational resources designed to help students practice and learn the difference between vowels and consonants in the English language. These worksheets often include various activities, such as identifying, sorting, or categorizing letters as vowels or consonants. What Are Vowels And Consonants? Vowels and consonants are the two primary categories of sounds in the English language. They have some differences and similarities, which can be explained as follows: Differences Sound Production – The main difference between vowels and consonants lies in how the sounds are produced. Vowel sounds are created when the air flows freely through the vocal tract without any significant obstruction. In contrast, consonant sounds involve some degree of constriction or closure in the vocal tract, which impacts the airflow. Role in Syllables – Vowels form the core of syllables, and every syllable contains at least one vowel sound. Consonants typically surround the vowel sounds in syllables and can appear at the beginning, middle, or end of a syllable. Number of Sounds – In the English language, there are five vowel letters (A, E, I, O, and U) but multiple vowel sounds, including short vowels, long vowels, and diphthongs. On the other hand, there are 21 consonant letters, which correspond to various consonant sounds, including stops, fricatives, nasals, and more. Similarities Both vowels and consonants are essential components of words in the English language. They work together to create meaningful words and help convey ideas and messages. Both types of sounds can vary in pronunciation depending on factors such as accent, dialect, and context. Vowels and consonants can both be affected by phonetic changes when they appear in different environments or in combination with other sounds. Understanding the differences and similarities between vowels and consonants is crucial for mastering English pronunciation, reading, and writing. By learning to recognize and produce these sounds accurately, language learners can improve their fluency and language skills. The Importance of Understanding Vowels vs. Consonants Understanding the distinction between vowels and consonants is of great importance for several reasons: Phonemic Awareness: Recognizing vowels and consonants fosters phonemic awareness—the ability to identify and manipulate individual phonemes (sounds). This skill is fundamental for early literacy and reading comprehension. Reading Proficiency: Accurate recognition and pronunciation of vowels and consonants are essential for reading fluency. Proficient readers need to quickly identify these letter categories to decode words correctly. Spelling Competence: Proficiency in distinguishing between vowels and consonants enhances spelling skills. When students can differentiate between these letter types, they are better equipped to spell words correctly. Foundational Knowledge: Understanding the roles of vowels and consonants forms the bedrock for more advanced phonics concepts and language development. Benefits Of Using Vowels vs. Consonants Worksheeets The “Vowels vs. Consonants” worksheet collection offers numerous advantages for students: Structured Learning: The worksheets are thoughtfully organized to provide students with a structured learning experience. They progress from basic exercises to more complex tasks, ensuring students build a strong foundation in differentiating vowels from consonants. Engaging Activities: Each worksheet incorporates fun and interactive activities, including sorting exercises, crossword puzzles, word searches, and sentence completion tasks. These activities make learning about vowels and consonants enjoyable, keeping students motivated and interested. Versatility: These worksheets can be used in various educational settings, including classrooms, homeschooling, and tutoring sessions. They are adaptable to students of different ages and proficiency levels. Enhanced Confidence: As students work through the worksheets and successfully grasp the distinction between vowels and consonants, their confidence in their reading, spelling, and language skills will grow. This boost in self-esteem can positively impact their overall academic performance. Improved Literacy Skills: Proficiency in recognizing and using vowels and consonants contributes to improved reading fluency, comprehension, spelling, and vocabulary development. This collection of Vowels vs. Consonants worksheets is a valuable resource for educators and parents committed to supporting their students’ phonics and literacy development. Proficiency in distinguishing between vowels and consonants is a foundational skill that opens doors to reading fluency, comprehension, effective spelling, and vocabulary growth. By using these engaging worksheets, students will strengthen their ability to recognize and use vowels and consonants with confidence. This collection is an investment in their future success, ensuring they have a solid foundation in phonemic awareness, phonics, spelling, and vocabulary. Embrace the “Vowels vs. Consonants” worksheets today, and watch your students excel in their journey toward becoming skilled and confident readers and writers. Page 2 Introducing the “Vowel vs. Consonant” worksheet – a brilliant tool designed to help learners differentiate between vowels and consonants in a fun and interactive manner. Students are presented with colorful illustrations of characters, each embodying a letter from the alphabet. Their task? To decide if the letter represented is a vowel (V) or a consonant (C). From ‘A’ to ‘K’, this sheet encompasses a variety of letters, ensuring students get a balanced exposure to both vowel and consonant characters. What makes this worksheet stand out is its engaging visual approach. Each letter doesn’t merely exist as a static character on the page; it comes to life through imaginative illustrations, capturing the students’ attention and making the learning process enjoyable. For instance, the letter ‘H’ is represented as a happy horse, while the letter ‘E’ takes on the form of an energetic elf. This method promotes memory retention and association, as students not only recognize the letters but also associate them with their corresponding images. As such, educators and parents will find this worksheet a valuable asset in their arsenal of educational tools, ensuring young learners grasp the foundational concept of vowels versus consonants. For students who are comfortable with printing letters, they can use these worksheets to write in the missing vowel for the pictured word. All vowels make a short vowel sound. These worksheets reinforce the connection between the printed letter and the sound they make, in the context of familiar words. Vowels and Consonants Worksheets are valuable resources for Kindergarten students who are just starting to learn how to read and write. These worksheets help students understand the basics of phonics by focusing on the two primary types of sounds in the English language: vowels and consonants. Vowels are sounds that are produced by the vocal cords without any obstruction in the mouth or throat. They are represented by the letters A, E, I, O, U, and sometimes Y. Consonants, on the other hand, are sounds that are produced by the obstruction of air flow in the mouth or throat. They are represented by all the letters of the alphabet except for A, E, I, O, U, and sometimes Y. By using Vowels and Consonants Worksheets, students can learn to recognize and differentiate between these two types of sounds. The worksheets typically include exercises that require students to identify and circle vowels and consonants in words, as well as activities that involve matching vowels and consonants with their corresponding letters. These activities help students improve their phonemic awareness, which is the ability to hear and identify individual sounds within words. Developing phonemic awareness is a critical step in learning how to read and write, as it helps students understand the relationship between letters and sounds. In addition to improving phonemic awareness, Vowels and Consonants Worksheets also help students develop their language skills. By learning to recognize and identify different sounds, students can begin to understand how words are formed and how they can be manipulated to create new words. This knowledge is critical for building a strong vocabulary and for improving overall language proficiency. Moreover, Vowels and Consonants Worksheets are great for promoting literacy. They give students a fun and interactive way to practice their phonics skills and improve their reading and writing abilities. These worksheets are specifically designed for Kindergarten students, so they are age-appropriate and easy to understand. Finally, Vowels and Consonants Worksheets are useful because they are versatile. They can be used in a variety of settings, including the classroom, homeschooling, and tutoring. They are also easily accessible and can be found online or in educational resource books. In conclusion, Vowels and Consonants Worksheets are an essential learning tool for Kindergarten students. They help improve phonemic awareness, language skills, and literacy, and they are easy to use and accessible. Math Reading Kindergarten Vocabulary Spelling Spelling by Grade Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Grammar & Writing Science Science by Grade Kindergarten Grade 1 Grade 2 Grade 3 Cursive | Bookstore If you're assigning this to your students, copy the worksheet to your account and save. When creating an assignment, just select it as a template! Using Worksheets on Vowels and Consonants Vowel and consonant worksheets play an essential role in the foundational stages of language learning for kids, particularly for kindergarten and first grade students. Understanding the difference between letters and their sounds is pivotal in mastering phonics, spelling, and pronunciation. These worksheets are designed to make learning fun and interactive for students, offering a variety of engaging activities that help identify a vowel sound or a consonant sound. These tools provide a structured yet flexible approach to education. Building a Foundation: Early Literacy Focusing on early literacy skills is crucial, and instructing in consonants is a fundamental part of this journey. By laying a solid foundation in these areas, kids are better prepared for more advanced language skills later on. Here’s how focusing on this topic can contribute to early literacy. Phonemic Awareness Development: Early exposure to vowel letters and their relative sound helps in developing phonemic awareness—the ability to hear, identify, and manipulate individual sounds in spoken words. This is a critical step towards learning to read. Transition to Reading: Understanding the difference between each letter, and their roles in words, helps kids make the transition from spoken to written language more smoothly. This understanding is key to decoding words in reading and constructing words. Vocabulary Expansion: As kids learn to use different vowel letters, they naturally begin to expand their vocabulary, as well as their reading fluency and reading comprehension. This not only aids in language development but also in cognitive development, as they learn to express themselves more clearly. Building Confidence in Literacy Skills: Early mastery of basic concepts like letters can boost children’s confidence in their literacy skills. This confidence and increased reading fluency can encourage a more positive attitude towards learning and education in general. Preparation for School and Beyond: A strong foundation in letter sounds, from long vowels to short vowel words, sets young learners up for success in school. It prepares them not only for reading but also for the more complex linguistic and cognitive tasks they will encounter in higher grades. Individualized Practice Opportunities: Focusing on letter sounds allows educators and parents to cater to individual needs early on. Whether a child is a fast learner or needs more support, early literacy activities can be tailored accordingly. Incorporating vowels and consonants into early literacy is not just about helping students to learn consonant and vowel sounds; it's about nurturing a love for language, which is vital for a child's academic and personal growth. Strategies to Teach with Free Printable Vowels and Consonants Worksheets Introducing letter sounds effectively in the classroom or at home requires a blend of creative teaching methods and practical strategies. The key to this process is understanding that every student learns differently, and incorporating a variety of techniques to learn vowel sounds can cater to diverse learning styles. Phonics Games: Interactive games that focus on sound recognition can be extremely effective. These games can range from online interactive tools to simple board games focusing on word formation and letter sounds. Storytelling and Reading Aloud: Using stories and books where kids are encouraged to identify sounds, such as consonant sounds or short vowel sounds, as you read can be a captivating way to learn. This not only improves their comprehension of words but also enhances their listening and comprehension skills. Visual Aids and Flashcards: Visual cues are essential for memory retention. Flashcards with short vowel sounds, long vowel sounds, consonant sounds, or even digraphs, especially those with pictures representing the sound of the letter, can be a helpful tool. Singing and Music: Children often respond well to music and rhythm. Songs that highlight different letter sounds can be a fun and memorable way to learn. Letter Practice: Regular exercises where children practice identifying sounds can solidify their comprehension. This could include tracing a letter, having kids write simple words, or even attempting short sentences as they progress. Tailored Worksheets: Using a variety of worksheets, from those that focus on knowing sounds like identify vowels and consonants worksheets to more advanced blending consonants and vowels worksheets, can provide structured yet flexible opportunities to learn. Vowels and Consonants Worksheet Ideas Here are some worksheet idea types that can be incorporated into the classroom. Color-Coded Letter Sorting: Free worksheets can include a color-coding system where children are asked to color a vowel and a consonant in different colors. This visual distinction helps them differentiate between the two sets of letters in the alphabet. Word Creation Challenges: Free printable vowel and consonant worksheets feature a template where students can combine letters to form words. This practice helps them understand how different sounds blend to form syllables and complete words. Phonetic Pronunciation Guides: Differentiating vowels and consonants worksheets focus on phonics. These include sentences or single words where students must write the phonetic pronunciation, emphasizing the sounds in words and practicing differentiation between short vowels and long vowels. Syllable Counting Exercises: Consonants and vowels worksheets encourage students to break words down into syllables. This exercise not only aids in spelling but also in comprehending the rhythmic structure of words. Interactive Crosswords and Puzzles: Downloadable or printable consonant and vowel worksheets can include crosswords or puzzles. These not only make school engaging but also help reinforce the difference between these vowels and consonant sounds, or short vowels and long vowels, in a fun way. Worksheet Generator Tools: Utilizing a worksheet generator or maker gives teachers the flexibility to design their own worksheets. These tools can be tailored to the specific educational needs and levels of their students. These worksheets are not only educational but also provide a free and fun way for kids to learn the basics of the English language. They are an excellent resource for teachers looking for creative and effective ideas to enhance their pedagogy. More Storyboard That Resources and Free Printables We have lots of templates to choose from. Take a look at our example for inspiration! Once you do this, you will be directed to the storyboard creator. Be sure to call it something related to the topic so that you can easily find it in the future. This is where you will include directions, specific images, and make any aesthetic changes that you would like. The options are endless! When you are finished, click this button in the lower right hand corner to exit your storyboard. From here you can print, download as a PDF, attach it to an assignment and use it digitally, and more! Happy Creating! Frequently Asked Questions about Vowels and Consonants Worksheets What is the importance of teaching vowels and consonants to children? Understanding the distinction between vowels and consonants is fundamental in language development. It aids in the development of phonemic awareness, which is crucial for reading and spelling. Recognizing vowels and consonants helps children in decoding words, improving their pronunciation, and understanding the structure of the English language. It's a foundational skill that supports all aspects of literacy. How can I make learning vowels and consonants engaging for my child? To make learning about vowels and consonants more engaging, try incorporating interactive worksheets and activities. For instance, use color-coded worksheets, word puzzles, and phonetic pronunciation guides. You can also include games that involve identifying vowels and consonants in everyday objects or storybooks. The key is to make the learning experience fun and relevant to their interests. At what age should children start learning about vowels and consonants? Children can start learning about vowels and consonants as soon as they begin showing interest in letters and sounds, typically around preschool age (3-4 years old). Initially, the focus should be on recognizing and pronouncing letters. As they grow older and enter kindergarten, more structured learning through worksheets and formal lessons can be introduced to consolidate their understanding. Remember, every child is different, so it's important to tailor the learning process to their developmental stage and interest level. Includes: 1 School 5 Teachers for One Year 1 Hour of Virtual PD *(This Will Start a 2-Week Free Trial - No Credit Card Needed) © 2025 - Clever Prototypes, LLC - All rights reserved. StoryboardThat is a trademark of Clever Prototypes, LLC, and Registered in U.S. Patent and Trademark Office Share — copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution — You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Math Reading Kindergarten Vocabulary Spelling Spelling by Grade Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Grammar & Writing Science Science by Grade Kindergarten Grade 1 Grade 2 Grade 3 Cursive | Bookstore Math Reading Kindergarten Vocabulary Spelling Spelling by Grade Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Grammar & Writing Science Science by Grade Kindergarten Grade 1 Grade 2 Grade 3 Cursive | Bookstore Sound in spoken language, articulated with an open vocal tract This article includes a list of general references, but it lacks sufficient corresponding inline citations. Please help to improve this article by introducing more precise citations. (November 2017) (Learn how and when to remove this message) IPA: Vowels Front Central Back Close i y ɨ ʉ ɯ u Near-close ɪ ʏ ʊ Close-mid e ø ɘ ɵ ɤ o Mid ɛ̝ œ̝ ɜ ɞ ʌ ɔ Near-open æ ɐ Open a ɶ ä ɑ ɒ IPA help audio full chart template Legend: unrounded • rounded This article contains phonetic transcriptions in the International Phonetic Alphabet (IPA). For an introductory guide on IPA symbols, see Help:IPA. For the distinction between [ ], / / and ⟨ ⟩, see IPA § Brackets and transcription delimiters. A vowel is a speech sound pronounced without any stricture in the vocal tract,[1] forming the nucleus of a syllable. Vowels are one of the two principal classes of speech sounds, the other being the consonant. Vowels vary in quality, in loudness and also in quantity (length). They are usually voiced and are closely involved in prosodic variation such as tone, intonation and stress. The word vowel comes from the Latin word vocalis, meaning "vocal" (i.e. relating to the voice).[2] In English, the word vowel is commonly used to refer both to vowel sounds and to the written symbols that represent them (⟨a⟩, ⟨e⟩, ⟨i⟩, ⟨o⟩, ⟨u⟩, and sometimes ⟨w⟩ and ⟨y⟩).[3] An idealized schematic of vowel space, based on the formants of Daniel Jones and John Wells pronouncing the cardinal vowels of the IPA. The scale is logarithmic. The grey range is where F2 would be less than F1, which by definition is impossible. [a] is an extra-low central vowel. Phonemically it may be front or back, depending on the language. Rounded vowels that are front in tongue position are front-central in formant space, while unrounded vowels that are back in articulation are back-central in formant space. Thus [y ʉ] have perhaps similar F1 and F2 values to the high central vowels [ɨ ʉ], being distinguished by rounding (F3); similarly [ø ɤ] vs central [ə ɵ] and [œ ʌ] vs central [ɜ ɞ]. There are two complementary definitions of vowel, one phonetic and the other phonological. In the phonetic definition, a vowel is a sound, such as the English "ah" /ɑː/ or "oh" /oʊ/, produced with an open vocal tract; it is median (the air escapes along the middle of the tongue), oral (at least some of the airflow must escape through the mouth), frictionless and continuant.[4] There is no significant build-up of air pressure at any point above the glottis. This contrasts with consonants, such as the English "sh" [ʃ], which have a constriction or closure at some point along the vocal tract. In the phonological definition, a vowel is defined as syllabic, the sound that forms the peak of a syllable.[5] A phonetically equivalent but non-syllabic sound is a semivowel. In oral languages, phonetic vowels normally form the peak (nucleus) of many or all syllables, whereas consonants form the onset and (in languages that have them) coda. Some languages allow other sounds to form the nucleus of a syllable, such as the syllabic (i.e., vocalic) l in the English word table [ˈtʰeɪ.bl̩] (when not considered to have a weak vowel sound: [ˈtʰeɪ.bəl]) or the syllabic r in the Serbo-Croatian word vrt [v̩rt̪] "garden". The phonetic definition of "vowel" (i.e. a sound produced with no constriction in the vocal tract) does not always match the phonological definition (i.e. a sound that forms the peak of a syllable).[6] The approximants [j] and [w] illustrate this: both are without much of a constriction in the vocal tract (so phonetically they seem to be vowel-like), but they occur at the onset of syllables (e.g. in "yet" and "wet") which suggests that phonologically they are consonants. A similar debate arises over whether a word like bird in a rhotic dialect has an r-colored vowel /ɝ/ or a syllabic consonant /ɹ̩/. The American linguist Kenneth Pike (1943) suggested the terms "vocoid" for a phonetic vowel and "vowel" for a phonological vowel,[7] so using this terminology, [j] and [w] are classified as vocoids but not vowels. However, Maddieson and Emmory (1985) demonstrated from a range of languages that semivowels are produced with a narrower constriction of the vocal tract than vowels, and so may be considered consonants on that basis.[8] Nonetheless, the phonetic and phonemic definitions would still conflict for the syllabic /l/ in table or the syllabic nasals in button and rhythm. X-rays of Daniel Jones' [i, u, a, ɑ] The original vowel quadrilateral, from Jones' articulation. The vowel trapezoid of the modern IPA, and at the top of this article, is a simplified rendition of this diagram. The bullets are the cardinal vowel points. (A parallel diagram covers the front and central rounded and back unrounded vowels.) The cells indicate the ranges of articulation that could reasonably be transcribed with those cardinal vowel letters, [i, e, ɛ, a, ɑ, ɔ, o, u, ɨ], and non-cardinal [ə]. If a language distinguishes fewer than these vowel qualities, [e, ɛ] could be merged to ⟨e⟩, [o, ɔ] to ⟨o⟩, [a, ɑ] to ⟨a⟩, etc. If a language distinguishes more, ⟨ɪ⟩ could be added where the ranges of [i, e, ɨ, ə] intersect, ⟨ʊ⟩ where [u, o, ɨ, ə] intersect, and ⟨ɐ⟩ where [ɛ, ɔ, a, ɑ, ə] intersect. The traditional view of vowel production, reflected for example in the terminology and presentation of the International Phonetic Alphabet, is one of articulatory features that determine a vowel's quality as distinguishing it from other vowels. Daniel Jones developed the cardinal vowel system to describe vowels in terms of the features of tongue height (vertical dimension), tongue backness (horizontal dimension) and roundedness (lip articulation). These three parameters are indicated in the schematic quadrilateral IPA vowel diagram on the right. There are additional features of vowel quality, such as the velum position (nasality), type of vocal fold vibration (phonation), and tongue root position. This conception of vowel articulation has been known to be inaccurate since 1928. Peter Ladefoged has said that "early phoneticians... thought they were describing the highest point of the tongue, but they were not. They were actually describing formant frequencies."[9] (See below.) The IPA Handbook concedes that "the vowel quadrilateral must be regarded as an abstraction and not a direct mapping of tongue position."[10] Nonetheless, the concept that vowel qualities are determined primarily by tongue position and lip rounding continues to be used in pedagogy, as it provides an intuitive explanation of how vowels are distinguished. Theoretically, vowel height refers to the vertical position of either the tongue or the jaw (depending on the model) relative to either the roof of the mouth or the aperture of the jaw. In practice, however, it refers to the first formant (lowest resonance of the voice), abbreviated F1, which is associated with the height of the tongue. There are two terms commonly applied to refer to two degrees of vowel height: in close vowels, also known as high vowels, such as [i] and [u], the first formant is consistent with the tongue being positioned close to the palate, high in the mouth, whereas in open vowels, also known as low vowels, such as [a], F1 is consistent with the jaw being open and the tongue being positioned low in the mouth. Height is defined by the inverse of the F1 value: the higher the frequency of the first formant, the lower (more open) the vowel.[a] In John Esling's usage, where fronted vowels are distinguished in height by the position of the jaw rather than the tongue, only the terms 'open' and 'close' are used, as 'high' and 'low' refer to the position of the tongue. The International Phonetic Alphabet has letters for six degrees of vowel height for full vowels (plus the reduced mid vowel [ə]), but it is extremely unusual for a language to distinguish this many degrees without other attributes. The IPA letters distinguish (sorted according to height, with the top-most one being the highest and the bottom-most being the lowest): close (a.k.a. high): i y ɨ ʉ ɯ u near-close (a.k.a. near-high): ɪ ʏ ʊ close-mid (a.k.a. high-mid): e ø ɘ ɵ ɤ o mid: (the reduced vowel [ə]) open-mid (a.k.a. low-mid): ɛ œ ɜ ɞ ʌ ɔ near-open (a.k.a. near-low): æ (plus the reduced vowel [ɐ]) open (a.k.a. low): a ɶ ɑ ɒ The letters ⟨e, ø, ɘ, ɵ, ɤ, o⟩ are defined as close-mid but are commonly used for four mid vowels. If more precision is required, true mid vowels may be written with a lowering or raising diacritic: ⟨e̞, ø̞, ɘ̞, ɵ̞, ɤ̞, o̞⟩ or ⟨ɛ̝ œ̝ ɜ̝ ɞ̝ ʌ̝ ɔ̝⟩. The Kensiu language, spoken in Malaysia and Thailand, is highly unusual in contrasting true mid vowels with both close-mid and open-mid vowels, without any additional parameters such as length, roundness or ATR. The front vowels, /i ɪ e e̞ ɛ/, along with open /a/, make a six-way height distinction; this holds even for the nasal vowels. A few varieties of German have been reported to have five contrastive vowel heights that are independent of length or other parameters. For example, the Bavarian dialect of Amstetten has thirteen long vowels, which have been analyzed as four vowel heights (close, close-mid, mid, open-mid) each among the front unrounded, front rounded, and back rounded vowels, along with an open vowel for a fifth height: /i e ɛ̝ ɛ/, /y ø œ̝ œ/, /u o ɔ̝ ɔ/, /ɑ/. Apart from the aforementioned Kensiu language, no other language is known to contrast more than four degrees of vowel height. The parameter of vowel height appears to be the primary cross-linguistic feature of vowels in that all spoken languages that have been researched till now use height as a contrastive feature. No other parameter, even backness or rounding (see below), is used in all languages. Some languages have vertical vowel systems in which at least at a phonemic level, only height is used to distinguish vowels. Idealistic tongue positions of cardinal front vowels with highest point indicated Vowel backness is named for the position of the tongue during the articulation of a vowel relative to the back of the mouth. As with vowel height, however, it is defined by a formant of the voice, in this case the second, F2, not by the position of the tongue. In front vowels, such as [i], the frequency of F2 is relatively high, which generally corresponds to a position of the tongue forward in the mouth, whereas in back vowels, such as [u], F2 is low, consistent with the tongue being positioned towards the back of the mouth. The International Phonetic Alphabet defines five degrees of vowel backness (sorted according to backness, with the top-most one being the front-most back and the bottom-most being the back-most): front near-front central near-back back To them may be added front-central and back-central, corresponding to the vertical lines separating central from front and back vowel spaces in several IPA diagrams. However, front-central and back-central may also be used as terms synonymous with near-front and near-back. No language is known to contrast more than three degrees of backness nor is there a language that contrasts front with near-front vowels nor back with near-back ones. Although some English dialects have vowels at five degrees of backness, there is no known language that distinguishes five degrees of backness without additional differences in height or rounding. Main article: Roundedness Roundedness is named after the rounding of the lips in some vowels. Because lip rounding is easily visible, vowels may be commonly identified as rounded based on the articulation of the lips. Acoustically, rounded vowels are identified chiefly by a decrease in F2, although F1 is also slightly decreased. In most languages, roundedness is a reinforcing feature of mid to high back vowels rather than a distinctive feature. Usually, the higher a back vowel, the more intense is the rounding. However, in some languages, roundedness is independent from backness, such as French and German (with front rounded vowels), most Uralic languages (Estonian has a rounding contrast for /o/ and front vowels), Turkic languages (with a rounding distinction for front vowels and /u/), and Vietnamese with back unrounded vowels. Nonetheless, even in those languages there is usually some phonetic correlation between rounding and backness: front rounded vowels tend to be more front-central than front, and back unrounded vowels tend to be more back-central than back. Thus, the placement of unrounded vowels to the left of rounded vowels on the IPA vowel chart is reflective of their position in formant space. Different kinds of labialization are possible. In mid to high rounded back vowels the lips are generally protruded ("pursed") outward, a phenomenon known as endolabial rounding because the insides of the lips are visible, whereas in mid to high rounded front vowels the lips are generally "compressed" with the margins of the lips pulled in and drawn towards each other, a phenomenon known as exolabial rounding. However, not all languages follow that pattern. Japanese /u/, for example, is an exolabial (compressed) back vowel, and sounds quite different from an English endolabial /u/. Swedish and Norwegian are the only two known languages in which the feature is contrastive; they have both exo- and endo-labial close front vowels and close central vowels, respectively. In many phonetic treatments, both are considered types of rounding, but some phoneticians do not believe that these are subsets of a single phenomenon and posit instead three independent features of rounded (endolabial), compressed (exolabial), and unrounded. The lip position of unrounded vowels may also be classified separately as spread and neutral (neither rounded nor spread).[12] Others distinguish compressed rounded vowels, in which the corners of the mouth are drawn together, from compressed unrounded vowels, in which the lips are compressed but the corners remain apart as in spread vowels. Front, raised and retracted are the three articulatory dimensions of vowel space. Open and close refer to the jaw, not the tongue. The conception of the tongue moving in two directions, high–low and front–back, is not supported by articulatory evidence and does not clarify how articulation affects vowel quality. Vowels may instead be characterized by the three directions of movement of the tongue from its neutral position: front (forward), raised (upward and back), and retracted (downward and back). Front vowels ([i, e, ɛ] and, to a lesser extent [ɨ, ɵ, ɜ, æ], etc.), can be secondarily qualified as close or open, as in the traditional conception, but this refers to jaw rather than tongue position. In addition, rather than there being a unitary category of back vowels, the regrouping posits raised vowels, where the body of the tongue approaches the velum ([u, o, ɨ], etc.), and retracted vowels, where the root of the tongue approaches the pharynx ([ɑ, ɔ], etc.): front raised retracted Membership in these categories is scalar, with the mid-central vowels being marginal to any category.[13] Main articles: Nasal vowel and Nasalization Nasalization occurs when air escapes through the nose. Vowels are often nasalised under the influence of neighbouring nasal consonants, as in English hand [hæ̃nd]. Nasalised vowels, however, should not be confused with nasal vowels. The latter refers to vowels that are distinct from their oral counterparts, as in French /ɑ/ vs. /ɑ̃/.[14] In nasal vowels, the velum is lowered, and some air travels through the nasal cavity as well as the mouth. An oral vowel is a vowel in which all air escapes through the mouth. Polish and Portuguese also contrast nasal and oral vowels. Main article: Phonation Voicing describes whether the vocal cords are vibrating during the articulation of a vowel. Most languages have only voiced vowels, but several Native American languages, such as Cheyenne and Totonac, have both voiced and devoiced vowels in complementary distribution. Vowels are devoiced in whispered speech. In Japanese and in Quebec French, vowels that are between voiceless consonants are often devoiced. Keres is disputed to have phonemic voiceless vowels but no language is confirmed to have them phonemically. Modal voice, creaky voice, and breathy voice (murmured vowels) are phonation types that are used contrastively in some languages. Often, they co-occur with tone or stress distinctions; in the Mon language, vowels pronounced in the high tone are also produced with creaky voice. In such cases, it can be unclear whether it is the tone, the voicing type, or the pairing of the two that is being used for phonemic contrast. The combination of phonetic cues (phonation, tone, stress) is known as register or register complex. Main articles: Tenseness and Checked and free vowels Tenseness is used to describe the opposition of tense vowels vs. lax vowels. This opposition has traditionally been thought to be a result of greater muscular tension, though phonetic experiments have repeatedly failed to show this.[citation needed] Unlike the other features of vowel quality, tenseness is only applicable to the few languages that have this opposition (mainly Germanic languages, e.g. German), whereas the vowels of the other languages (e.g. Spanish) cannot be described with respect to tenseness in any meaningful way.[citation needed] One may distinguish the English tense vs. lax vowels roughly, with its spelling. Tense vowels usually occur in words with the final silent ⟨e⟩, as in mate. Lax vowels occur in words without the silent ⟨e⟩, such as mat. In American English, lax vowels [ɪ, ʊ, ɛ, ʌ, æ] do not appear in stressed open syllables.[15] In traditional grammar, long vowels vs. short vowels are more commonly used, compared to tense and lax. The two sets of terms are used interchangeably by some because the features are concomitant in some varieties of English.[clarification needed] In most Germanic languages, lax vowels can only occur in closed syllables. Therefore, they are also known as checked vowels, whereas the tense vowels are called free vowels since they can occur in any kind of syllable.[citation needed] Main articles: Advanced and retracted tongue root and Vowel harmony Advanced tongue root (ATR) is a feature common across much of Africa, the Pacific Northwest, and scattered other languages such as Modern Mongolian.[16] The contrast between advanced and retracted tongue root resembles the tense-lax contrast acoustically, but they are articulated differently. Those vowels involve noticeable tension in the vocal tract. Main article: Pharyngealization Pharyngealized vowels occur in some languages like Sedang and the Tungusic languages. Pharyngealisation is similar in articulation to retracted tongue root but is acoustically distinct. A stronger degree of pharyngealisation occurs in the Northeast Caucasian languages and the Khoisan languages. They might be called epiglottalized since the primary constriction is at the tip of the epiglottis. The greatest degree of pharyngealisation is found in the strident vowels of the Khoisan languages, where the larynx is raised, and the pharynx constricted, so that either the epiglottis or the arytenoid cartilages vibrate instead of the vocal cords. The terms pharyngealized