

Relationship Between Core Mathematics Learnings and TACT Competencies

7th Grade

Mathematics Core Learning	Competences (T-ACT)
Compare integers and rational numbers in various contexts, with and without the use of the number line.	M4. Facts and opinions The learner differentiates between facts, fact interpretation, and opinions.
Perform calculations with and without a calculator, using integers (multiplication, division, exponentiation with natural exponents) and rational numbers (addition, subtraction, multiplication, division), using exact and approximate values and in different representations. Assess the effect of operations and make plausible estimates.	S6. The role of individual actions The learner explains how everyone's ability to create and share information impacts the information ecosystem.
Identify square roots of perfect squares and relate powers and roots in these cases.	D3. Search engines and user profiling The learner explains how search engines adapt their results based on user profiling.
Solve problems involving rational numbers in mathematical and non-mathematical contexts, designing and applying resolution strategies (including the use of technology), and evaluating the plausibility of results.	D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Analyze polygons, identifying their properties and classifying them accordingly.	S5. Content credibility The learner demonstrates, using examples, how a large number of identical or similar information pieces is not a measure of credibility.
Construct quadrilaterals from given conditions using appropriate tools, including digital technology.	D2. Echo chambers and info bubbles The learner explains the concepts of 'echo chamber' and 'information bubble'.
Understand the formulas for calculating areas of polygons (regular polygons and trapezoids) and use them to solve problems in various contexts.	D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Identify and represent similarity of plane figures using appropriate tools and	S8. Potential harm The learner discusses critically the

materials (including digital technology), and use them in different contexts, predicting and describing the results, including effects on lengths and areas.	possible harm resulting from a suspected or identified disinformation/misinformation item.
Recognise patterns and determine a rule for generating a numerical or non-numerical sequence, as well as an algebraic expression that represents it.	D1. Content amplification The learner demonstrates that they understand various techniques used by media platforms to emphasise, amplify and extend the reach of their content.
Recognize, interpret, and solve first-degree equations with one variable (without denominators) and use them to represent situations in mathematical and real-life contexts.	S1. Action triggers The learner demonstrates an understanding of how the structure, content and wording of a piece of information can be designed to influence opinions or trigger actions.
Graphically represent and interpret a linear function and relate the graphical and algebraic representations.	D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Interpret and produce statistical information and use it to solve problems and make informed decisions.	S2. Fact-checking The learner is aware of the practice of fact-checking and recognises relevant (national and international) fact-checking outlets. M6. Claim verification The learner checks the veracity of a claim seen online.

10th Grade

Mathematics Core Learning	Competences (T-ACT)
Recognise the meaning of the formula for calculating the distance between two points on the plane based on their coordinates.	D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Recognise the meaning of the coordinates of the midpoint of a given line segment, the Cartesian equation of the perpendicular bisector of a line segment, the Cartesian equations and inequalities of a set of points (including half-planes and circles), and the standard form of the Cartesian equation of a circle.	S4. Official and unofficial sources The learner differentiates between official and unofficial sources of information. M5. Sources of information The learner traces the source of information in a media article to confirm it reports correctly on facts.
Identify orthonormal Cartesian coordinate systems in space.	M4. Facts and opinions The learner differentiates between facts, fact interpretation, and opinions.
Recognise the meaning of the equations of planes parallel to the coordinate planes; Cartesian equations of lines parallel to one of the axes; distance between two points in space; equation of the perpendicular bisecting plane of a line segment; standard form of the Cartesian equation of a spherical surface; and standard form of the Cartesian inequality of a sphere.	S5. Content credibility The learner demonstrates, using examples, how a large number of identical or similar information pieces is not a measure of credibility. D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Recognize, analyze and apply in problem solving: vector norms; scalar multiplication of a vector and its relation to collinearity and opposite vectors; vector sum and difference; properties of vector operations; coordinates of vectors; position vectors and their coordinates; coordinates of vector sum and difference; scalar multiplication and opposite vectors; coordinates of collinear vectors; difference vector between two points and its coordinates; point resulting from adding a point and a vector; norm calculation of a vector; direction vector of a line; relation between a direction vector	D2. Echo chambers and info bubbles The learner explains the concepts of 'echo chamber' and 'information bubble'. S6. The role of individual actions The learner explains how everyone's ability to create and share information impacts the information ecosystem.

and the line slope; parallelism and slope equality.	
Recognise, analyse and apply in problem-solving the extension to three-dimensional space of the basic concepts and properties of vector calculus.	D1. Content amplification The learner demonstrates that they understand various techniques used by media platforms to emphasise, amplify and extend the reach of their content.
Understand and apply in problem solving the vector equation of a line in the plane and in space.	D3. Search engines and user profiling The learner explains how search engines adapt their results based on user profiling. M6. Claim verification The learner checks the veracity of a claim seen online.
Recognise, represent and interpret graphically real-valued functions of a real variable and functions defined by analytical expressions, and use them in problem-solving and modelling contexts.	S2. Fact-checking The learner is aware of the practice of fact-checking and recognises relevant (national and international) fact-checking outlets. D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Recognize and interpret geometric properties of function graphs and use them in problem-solving and modeling contexts.	D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.
Recognise and interpret parity; the symmetries of the graphs of even and odd functions; the intervals of monotonicity of a real-valued function of a real variable; relative and absolute extrema, and use them in problem-solving and modelling contexts.	S7. Communicator's intent The learner discusses critically the possible intent of the author/s of an information item. S1. Action triggers The learner demonstrates an understanding of how the structure, content and wording of a piece of information can be designed to influence opinions or trigger actions.
Recognize and interpret extrema, concavity, roots, and graphical representation of quadratic functions and use them in modeling and problem solving.	S1. Action triggers The learner demonstrates an understanding of how the structure, content and wording of a piece of

	information can be designed to influence opinions or trigger actions.
Recognise and interpret graphically the relationship between the graph of a function and the graphs of the functions $a \cdot f(x)$, $f(b \cdot x)$, $f(x + c)$, and $f(x) + d$, where a , b , c , and d are real numbers with a and b nonzero, and use them in problem-solving and modelling contexts.	<p>S1. Action triggers The learner demonstrates an understanding of how the structure, content and wording of a piece of information can be designed to influence opinions or trigger actions.</p> <p>D4. Detection of digital deception The learner identifies and explains instances where digital content is manipulated or distorted to deceive users.</p>

Media Literacy Aspect: What to Address in Each Competency

- **M1: Media Ownership, Funding, Agenda:** Analyze graphical representations used in social media and online campaigns, identifying potential bias and data manipulation (AE10_19, AE10_21).
- **M2: Media Bias:** Interpret graphs and data to identify misinformation (e.g., manipulation of scale, color, axes) (AE10_23, AE10_21).
- **M3: Role of Media in Democracy:** Discuss how statistical data shape public opinion and democratic decisions, using real-life examples from campaigns or referendums (AE10_24).
- **M4: Facts and Opinions:** Distinguish between data-based interpretations and unsupported opinions through the analysis of graphs and values like mean and median (AE10_22).
- **M5: Sources of Information:** Assess the reliability of data sources such as national statistics offices, newspapers or social media, and identify the origin of data used in graphs (AE10_20, AE10_19).

Digital Literacy Aspect

- D1: Content Amplification: Reflect on the impact of data manipulation in scam campaigns on social media, showing how graphs amplify trends through manipulation of scale or visual presentation (AE10_19).
- D2: Echo Chambers and Info Bubbles: Assess the credibility of sources on social media by identifying how data repetition in social groups reinforces biased perceptions (AE10_22).
- D3: Search Engines & Profiling: Demonstrate how data and graph manipulation can influence user perception according to digital profiles, affecting their sense of reality (AE10_21).

Mathematics Competencies

- AE10_19: Interpret and Compare Statistical Graphs.
- AE10_21: Relate Different Data Representations.
- AE10_23: Analyze the Effect of Changes in Data on Graphical Representations.

MEDIA LITERACY ASPECT

Competence	Mathematics – 7th Grade	Justification	Mathematics – 10th Grade	Justification
M1. Media: ownership, funding, agenda	Collect, organize, and represent statistical data (AE7_16); Evaluate the appropriateness of graphical representations (AE7_18)	Critical analysis of how different entities present data with strategic purposes (e.g., in news or advertising campaigns).	Interpret and compare statistical graphs (AE10_19); Relate different data representations (AE10_21)	Exploration of how financial or political entities use data in different formats to support their positions or agendas (e.g., inflation, employment, credit). Examination of how different entities use data with specific interests (e.g., banks, the state).
M2. Media bias	Represent data using different graphs (AE7_16); Evaluate appropriateness of representations (AE7_18)	Identification of bias in graph presentation (e.g., manipulation of scale, color, omission of context).	Analyze the effect of data changes on graphs (AE10_23); Relate data representations (AE10_21)	Analysis of bias in statistical representation, based on the choice of graphs used in the media to favor certain interpretations. Analysis of bias in statistical representations used in the media.
M3. Role of media in democracy	Interpret graphs and justify conclusions (AE7_20); Mathematical communication (transversal AE)	Discussion on how statistical data shapes public opinion and democratic decisions using real-life examples (e.g., referendums).	Interpret and compare statistical graphs (AE10_19); Data project work (AE10_24)	Assessment of how mathematics and data representation affect public and democratic life (e.g., electoral projections, participatory budgets). Evaluation of the impact of mathematics on democratic decisions (e.g., seat allocation).

Competence	Mathematics – 7th Grade	Justification	Mathematics – 10th Grade	Justification
M4. Facts and opinions	Calculate and interpret measures of central tendency (AE7_17); Interpret graphs and justify conclusions (AE7_20)	Distinguish between interpretations supported by data and unsupported opinions by analyzing graphs and statistical values like mean and median.	Analyze the effect of data changes on graphs (AE10_23); Linear regression (AE10_22)	Evaluate whether a conclusion is evidence-based or merely a subjective opinion, distinguishing between data-supported conclusions and unsupported views.
M5. Sources of information	Collect and organize statistical data (AE7_16); Evaluate source reliability (transversal AE)	Compare sources such as INE (national statistics), newspapers, or social media to assess credibility and origin of data used in graphs.	Population and sampling (AE10_20); Statistical representation and inference (AE10_19, AE10_21)	Verify whether data comes from official sources and whether samples are representative of the population. Verification of statistical representativeness based on origin.
M6. Claim verification	Calculate mean, mode, median (AE7_17); Solve problems using real data (AE7_19)	Practically verify claims using classroom-collected data (e.g., speed, height, step count).	Descriptive statistics (AE10_19); Graph interpretation (AE10_21)	Confirm the truth of public statements using real statistical analysis (e.g., from news, campaigns)
M7. Evaluation of multiple sources	Represent same data in different ways (AE7_16, AE7_18)	Compare how different media outlets present the same data (e.g., unemployment rate), analyzing impact of graphical choices.	Statistical representation (AE10_19, AE10_21); Statistical modeling (AE10_22)	Evaluate discrepancies between data from different sources and potential bias (e.g., unemployment rates).

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M8. Evaluation of contradicting info	Interpret and justify different data representations (AE7_20)	Critically evaluate contradictory graphs on the same topic (e.g., climate, vaccines), identifying which is more reliable.	Projects using real data (AE10_24); Inference from data (AE10_22)	Use concrete data to refute misleading or contradictory media information, countering populist claims.
M9. Ethical considerations	Mathematical communication (transversal AE); AE7_18	Reflect on the ethical implications of distorting or omitting data in presentations or school reports.	Project work (AE10_24); Graphical representation (AE10_19)	Discuss ethical responsibility in using math to inform or manipulate, especially in the public sphere (e.g., financial or social reports).

DIGITAL LITERACY ASPECT

Competence	Mathematics – 7th Grade	Justification	Mathematics – 10th Grade	Justification
D1. Content amplification	Represent statistical data in different graphs (AE7_16); Evaluate graphical appropriateness (AE7_18)	Show how graphs can amplify trends through manipulation of scale or visual presentation.	Statistical representations using digital tools (AE10_19); Analyze changes in data on graphs (AE10_23)	Create and compare graphs with different scales and formats to understand their impact on public perception.
D2. Echo chambers and info bubbles	Calculate and interpret measures of central tendency (AE7_17); Interpret and justify conclusions from graphs (AE7_20)	Explore how repeated presentation of similar data in social groups can reinforce biased perceptions.	Correlation and causality (AE10_22); Critical data interpretation (AE10_21)	Analyze how misconceptions are perpetuated in digital environments through unverified or misleading correlations.
D3. Search engines & profiling	Collect and organize data (AE7_16); Critical information analysis (transversal AE)	Observe how search results and suggestions vary between users depending on their profiles.	Simulation and analysis of digital data (AE10_24); Data collection and inference (AE10_21)	Demonstrate how digital profiles influence the data shown to users, affecting their perception of reality.
D4. Detection of digital deception	Interpret and represent statistical data (AE7_18); Justify conclusions based on graphs (AE7_20)	Identify common visual manipulations: truncated scales, 3D graphs, distorted axes.	Analyze the effect of data changes on graphs (AE10_23); Statistical representations (AE10_19)	Compare two graphs built from the same dataset to show how different visual representations can lead to distinct interpretations.
D5. AI tools and disinformation	Recognize data manipulation in graphs (AE7_18); Evaluate information	Introduction to the concept of AI-generated graphs or fabricated data	Data simulation using software (AE10_24); Critical data analysis (AE10_21)	Create plausible fictional datasets using digital tools to discuss the risks of

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	sources (Cross-curricular AE)	with a credible appearance.		algorithmic disinformation.

SPECIAL ASPECT: DISINFORMATION / MANIPULATION

Competence	Mathematics – 7th Grade	Justification	Mathematics – 10th Grade	Justification
S1. Action triggers	Interpret and represent statistical data (AE7_18); Justify conclusions based on graphs (AE7_20)	Show how graphs with truncated scales, sensational titles or color use can induce fear (e.g., “crime explosion”).	Interpret and compare statistical graphs (AE10_19); Analyze the effect of data changes on graphs (AE10_23)	Evaluate graphical representations that exploit emotions in sensitive topics such as public health or safety and discuss their public impact.
S2. Fact-checking	Calculate central tendency measures (AE7_17); Solve problems with real data (AE7_19)	Check if general statements (e.g., “boys are faster”) hold true by collecting and analyzing real data.	Descriptive statistics (AE10_19); Statistical inference (AE10_21)	Validate or refute public claims using collected or official data, developing critical thinking.
S3. Conspiracy theories	Introduction to probability in real contexts (AE7_21); Mathematical communication (transversal AE)	Show how incorrect interpretations of probability fuel conspiracy theories (e.g., about lotteries, vaccines).	Correlation and causality (AE10_22); Linear regression (AE10_23)	Use statistical models to demonstrate lack of causal relationship in typical conspiracy theory claims.
S4. Official and unofficial sources	Collect and compare data from different sources (AE7_16); Evaluate graphical representations (AE7_18)	Assess data source reliability (e.g., INE, social media, unofficial sites) based on origin and collection methods.	Population and sampling (AE10_20); Graphical representations (AE10_19, AE10_21)	Distinguish between official and unofficial sources, assessing if sampling and data collection are adequate and trustworthy.
S5. Content credibility	Calculate mean, mode and median (AE7_17);	Analyze situations where number of shares or views is	Correlation ≠ causality (AE10_22); Data	Show that credibility must be based on statistical

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	Interpret graphs (AE7_20)	mistaken for credibility of information.	interpretation (AE10_21)	analysis, not on popularity or repetition.
S6. Role of individual actions	Create and communicate conclusions from graphs (AE7_20); Mathematical communication (transversal AE)	Reflect on student responsibility in how data is represented and shared (e.g., on social media or in presentations).	Project work with real data (AE10_24); Mathematical communication (transversal AE)	Assess the social impact of sharing data-based conclusions - whether true or manipulated - by individuals or groups.
S7. Communicator's intent	Assess intentions behind media graphs (AE7_18); Justify conclusions (AE7_20)	Identify the communicator's purpose in choosing a certain graph (e.g., to influence political opinion or promote a product).	Statistical representation and inference (AE10_19, AE10_21); Data communication (AE10_24)	Critically analyze political, economic, or social graphs and infer the intentions behind their design.
S8. Potential harm	Interpret graphs and justify conclusions (AE7_20); Mathematical communication (transversal AE)	Show how misleading representations (e.g., about vaccines or pandemics) can affect personal decisions and public health policies.	Projects with real data (AE10_24); Analyze consequences of disinformation (AE10_21, AE10_23)	Reflect on the real risks of disinformation based on false statistics - such as vaccine hesitancy or science denial.