





Catholic Social Teaching in Maths

<p>Life and Dignity of the Human Person</p> <p><i>All created in the image and likeness of God</i></p> 	<p style="text-align: center;">KSS3</p> <p>In mathematics education, students are encouraged to see each person's dignity by considering the human implications behind data and numbers. For example, studying statistics related to health, poverty, and education helps students understand real-life situations where human dignity is at stake. When students learn mathematical skills, they are empowered to contribute to human flourishing and social equity.</p>	<p style="text-align: center;">KSS4</p> <p>When looking at data, we explore the numerous statistics related to the human impact of a lack of clean water and food or communities and individuals affected by natural disasters.</p> <p>Statistics and Data Analysis: Students can use statistics to explore data related to life expectancy, healthcare access, or education disparities between different regions or social groups. For example, analysing infant mortality rates across different countries allows students to see how mathematical data reflects the value placed on human life.</p>	<p style="text-align: center;">KSS5</p> <p>Graph Theory: Use graph theory to model social networks that support individuals, such as healthcare systems or humanitarian aid distribution, illustrating the importance of each person's dignity.</p> <p>Students could analyse the effects of high-interest loans on families, discussing how financial systems can either support or undermine human dignity. Exploring topics like compound interest and the ethics of lending can raise awareness about the dangers of usury (unfairly high-interest rates) and how they can impact individuals' financial stability, violating CST's principles of justice and fairness.</p>
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	KS3	KS4	KS5
<p>Call to family, community and participation</p> <p><i>Whatever is needed for each person to flourish</i></p> 	<p>Mathematics fosters a sense of community through group projects, collaborative problem-solving, and discussions. Students participate in their learning by working together on problems, respecting each other's contributions, and developing skills that can be used to benefit their communities. Mathematics can also be used to analyse and improve community services, infrastructure, and participation in social and economic life.</p> <p>Year 7 and 8 Ratio and Proportions - This topic can be applied to understanding community demographics and the distribution of resources (e.g., food or housing) within a population, promoting discussions on fairness and community participation.</p> <p>Year 7 and 8 We use ratios to divide resources or money fairly, ensuring that everyone receives their fair share, based on need.</p> <p>Year 8 Children use direct proportion to scale recipes up and down. They choose recipes familiar to their family's culture.</p> <p>Using probability to discuss voting systems and how mathematical methods can ensure every person's vote is valued equally in democratic participation.</p>	<p>Algebraic problem-solving or geometric constructions can be done in groups to foster collaboration. For example, working together to solve complex algebraic equations encourages students to listen to one another, contributing to a sense of participation and teamwork.</p> <p>As a teaching strategy in Maths, we are tolerant of differing methods of learning and use class discussion to tackle mathematical problems, we often find varying strategies to come to the same solution. We teach that no method is better than the other and accept and listen to other points of view.</p>	<p>Students can apply geometric and trigonometric principles to design efficient, affordable housing or sustainable infrastructure in underdeveloped regions, supporting CST's focus on the human right to safe, dignified living conditions.</p>



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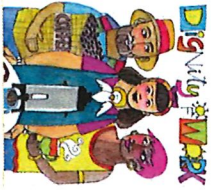
	KS3	KS4	KS5
<p>Solidarity</p> <p><i>Not just doing things for other people but acting with them to build a more just world together</i></p> 	<p>Mathematics can foster a sense of global solidarity by highlighting the interconnectedness of global issues, such as climate change, global markets, and the distribution of resources. In the classroom, mathematical topics like geography, population studies, and global economics help students see their role in solving problems that affect people worldwide. The curriculum can encourage students to work toward the common good using mathematical solutions.</p>	<p>Geometry or trigonometry can be used to study global issues, such as navigation, distances between countries, and global supply chains. These show how mathematics can unify the world by helping to solve international problems.</p> <p>Using the mean, median, and mode to analyse income distribution in a country and considering how the common good would be best served through more equitable distribution of resources.</p>	<p>Probability Theory: This can help model global risks such as pandemics, natural disasters, or economic crises. Through probability, students can assess how different regions of the world are interconnected and how we can work together to mitigate risks, emphasizing solidarity.</p> <p>Students could use statistics to analyse social issues such as income inequality, unemployment rates, or access to healthcare. They might explore how various factors (such as education or geographic location) correlate with social outcomes, promoting an understanding of the need for solidarity in working toward a more just society.</p>

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	KSS3	KSS4	KSS5
<p>Call to family, community and participation</p> <p><i>People have a right and duty to take part in shaping a more just and human society</i></p> 	<p>Mathematics fosters a sense of community through group projects, collaborative problem-solving, and discussions. Students participate in their learning by working together on problems, respecting each other's contributions, and developing skills that can be used to benefit their communities. Mathematics can also be used to analyse and improve community services, infrastructure, and participation in social and economic life.</p> <p>Year 8</p> <p>Problem Solving. Children use maths to plan events to raise money for charity fostering a sense of community and giving.</p>	<p>In Years 10 and 11 maths, students encounter more advanced concepts such as algebra, trigonometry, statistics, and financial mathematics. These topics can be linked to Catholic Social Teaching (CST) in the context of family life by exploring issues related to justice, the common good, human dignity, and the importance of solidarity within families and society.</p> <p>Algebraic equations can be used to model real-world problems like dividing financial resources among family members, ensuring equitable distribution in household budgets, or solving problems related to income distribution. This can tie into discussions about how resources in a society or a family should be shared for the benefit of all, particularly when considering the needs of children, elderly, or disadvantaged family members.</p> <p>Students can explore how families make collective decisions, such as planning vacations, managing health care choices, or deciding on major family expenses. Probability can be used to evaluate the risks and benefits of different decisions, promoting a deeper understanding of how family members contribute to and participate in decisions that impact the family as a whole.</p>	<p>Graphs and functions can be used to analyse the effects of various policies (e.g., tax rates, welfare programs) on families. For instance, students could model how changes in tax rates affect family incomes or how social services impact family well-being, encouraging reflection on how policies can promote or hinder justice for families.</p> <p>Students could use optimization techniques to solve problems related to resource allocation, such as the distribution of food aid, healthcare resources, or government funding to different regions or sectors. By maximizing efficiency and minimizing waste, these techniques can reflect CST's emphasis on ensuring the common good through fair resource distribution.</p>




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<p>The dignity of work and the rights of workers</p> <p><i>As far as possible, decisions should not be taken at the highest levels but by the people who are most affected</i></p> 	<p style="text-align: center;">KSS3</p> <p>Mathematics underpins fair labour practices, wage calculations, and economic justice. Students learn how to use mathematical reasoning to ensure that systems of work and employment are just. For instance, analysing the economics of living wages, working hours, and benefits can be informed by mathematics. This helps students see the importance of maths in defending the rights of workers and promoting the dignity of work.</p>	<p style="text-align: center;">KSS4</p> <p>Percentages and Ratios: Percentages can be applied to understand wage increases, benefits, and fair treatment in the workplace. Students can calculate fair wage distribution based on different job roles and responsibilities. Years 9, 10 and 11 Students calculate tax paid for different jobs</p>	<p style="text-align: center;">KSS5</p> <p>Linear Programming: This topic can be used to teach how businesses optimize resources, but it can also explore fair wages and efficient use of resources to ensure just treatment of workers. For instance, students can analyse scenarios where workers are paid fairly within constraints, ensuring dignity in the workforce.</p>
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	KS3	KS4	KS5
<p>Care for God's creation</p> <p><i>We are called to care for creation as stewards, not just as consumers</i></p> 	<p>Mathematical models are essential in understanding environmental sustainability and solving ecological problems.</p> <p>Through lessons in geometry – year 8, and statistics – year 7 and 8, students can engage with real-world problems like measuring pollution levels, analysing climate data, and calculating resource use.</p> <p>Statistics teach about climate change, carbon footprints, or resource consumption. Students could analyse trends in global temperatures or the effects of deforestation, helping them to understand their role in caring for the environment.</p> <p>The Mathematics department use classroom displays to pique the students' curiosity and to invite conversations that link Catholic Social Teaching to every day life.</p>	<p>Mathematical models are essential in understanding environmental sustainability and solving ecological problems.</p> <p>In years 9, 10 and 11 some students may take the option of the Duke of Edinburgh award. Orienteering and use of bearings to navigate the wilder areas of the UK and care for our environment calls for a care for God's creation.</p> <p>Year 9 Fibonacci Sequence is explored through nature - examining the wonder of patterned sequences in reation.</p> <p>Geometry can be applied to projects like calculating areas of deforestation or the efficiency of solar panels. For example, students can use surface area and volume calculations to understand how much land is being lost to deforestation or how much energy is saved using renewable resources.</p> <p>Calculating the area of a piece of land for sustainable farming, or measuring the volume of water in a reservoir, helping to illustrate the need for responsible management of Earth's resources.</p>	<p>Through lessons in calculus, and statistics, students can engage with real-world problems like measuring pollution levels, analysing climate data, and calculating resource use.</p> <p>Mathematics equips students to become stewards of the environment by providing tools to address and mitigate environmental challenges.</p> <p>Students could model population growth, resource depletion, or pollution levels using derivatives and integrals. These models can be used to analyse the sustainability of natural resources, promoting an understanding of how our current practices affect future generations and emphasizing the CST principle of responsible environmental stewardship.</p>




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<p>Rights and responsibilities</p> <p>When one person has a right, others have a responsibility to uphold that right</p> 	<p style="text-align: center;">KS3</p> <p>Learning mathematics equips students with the knowledge needed to fulfill their responsibilities as citizens and individuals in society. They gain the ability to critically assess issues like economic inequality, environmental sustainability, and the distribution of resources. Understanding financial literacy, for example, helps students recognize their rights and responsibilities in managing money and making informed decisions that affect themselves and others -calculating best buy options in year 7 and 8.</p>	<p style="text-align: center;">KS4</p> <p>Financial Mathematics: Years 9, 10, 11</p> <p>Teaching students about interest rates, loans, and budgeting empowers them to manage finances responsibly. Understanding the impact of compound interest or taxes also helps them make informed decisions and recognize their rights and responsibilities in financial contexts.</p>	<p style="text-align: center;">KS5</p> <p>Algebra:</p> <p>Use algebraic equations to explore the relationships between income, taxes, and public spending; helping students understand their civic responsibilities and rights within an economic system.</p> <p>A Level students might use matrix algebra to model and solve problems in public policy, such as determining the most efficient allocation of government funds to various social programs (e.g., healthcare, education, social services). These mathematical solutions can be connected to CST's focus on ensuring that all people, especially the marginalized, have their needs met in a just and equitable manner.</p>
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Catholic Social Teaching in Maths

	KSS3	KSS4	KSS5
<p>Option for the poor and the vulnerable</p> <p><i>To choose to consider the needs of the poorest and most vulnerable people first</i></p> 	<p>Mathematics can be used to advocate for social justice by highlighting inequalities and offering solutions. Students can explore how data reveals disparities in wealth, access to education, and healthcare. Through statistics, probability, and critical analysis, they can assess how policies or economic systems impact the poor and vulnerable and use mathematics to suggest equitable solutions.</p>	<p>Teachers support students to consider different wages and discuss a realistic percentage of that wage that can be used to support the poor and vulnerable, a key aspect of Catholic teaching, especially when considering how this can be exercised in society.</p>	<p>There are at least two related ideas behind “Social Justice Math”. The first is that you can use mathematics to teach and learn about issues of social and economic justice. The second is that you can learn maths through the study of social justice issues – the development of mathematical literacy itself being an incredibly important social justice issue.</p>